

# SERVICE MANUAL

# BA-5 CHASSIS

<u>MODEL</u>	<u>COMMANDER</u>	<u>DEST</u>	<u>CHASSIS NO.</u>
<b>KV-20FS12</b>	RM-Y173	US	SCC-S40A-A
<b>KV-20FS12</b>	RM-Y173	CND	SCC-S41A-A
<b>KV-20FV12</b>	RM-Y168	US	SCC-S40B-A
<b>KV-20FV12</b>	RM-Y168	CND	SCC-S41B-A
<b>KV-21FE12</b>	RM-Y173	E	SCC-S38A-A
<b>KV-21FE12A</b>	RM-Y173	E	SCC-S38F-A
<b>KV-21FE12C</b>	RM-Y173	E	SCC-S38B-A
<b>KV-21FM12</b>	RM-Y172	MX	SCC-S39A-A
<b>KV-21FV12</b>	RM-Y168	E	SCC-S38C-A
<b>KV-21FV12C</b>	RM-Y168	E	SCC-S38D-A



KV-21FV12



RM-Y168

**TRINITRON® COLOR TV**  
**SONY®**

## SPECIFICATIONS

	<b>KV-21FE12</b> <b>KV-21FE12A</b> <b>KV- 21FE12C</b>	<b>KV-21FM12</b>	<b>KV-20FS12</b>	<b>KV-20FV12</b>	<b>KV-21FV12</b>	<b>KV-21FV12C</b>
Power requirements	120-220V, 50/60 Hz	120-220V, 50/60 Hz	120V,60Hz	120V,60Hz	120-220V, 50/60 Hz	120-220V, 50/60 Hz
Number of inputs/outputs						
Video 1)	2	2	2	2	2	2
S Video 2)	1	1	1	1	1	1
Audio 3)	2	2	2	2	2	2
Audio Out 4)	--	--	--	1	1	1
Speaker output(W)	5W x 2	3W x 2	3W x 2	5W x 2	10W x 2	10W x 2
Power Consumption(W)						
In use(Max)	115W	115W	115W	150W	155W	150W
In standby	1W	1W	1W	1W	1W	1W
Dimensions(W/H/D)						
(mm)	512 x 475 x 493mm	512 x 475 x 493mm	512 x 475 x 493mm	562 x 466 x 503mm	562 x 466 x 503mm	562 x 466 x 503mm
(in)	20 1/8 x 18 11/16 x 19 7/16	20 1/8 x 18 11/16 x 19 7/16	20 1/8 x 18 11/16 x 19 7/16	22 1/4 x 18 3/8 x 19 7/8	22 1/4 x 18 3/8 x 19 7/8	22 1/4 x 18 3/8 x 19 7/8
Mass						
(kg)	24.5kg	24.5kg	24.5kg	27 kg	27 kg	27 kg
(lbs)	54 lbs	54 lbs	54 lbs	59 lbs. 8 oz.	59 lbs. 8 oz.	59 lbs. 8 oz.

- 1) Vp-p 75 ohms unbalanced, sync negative
- 2) Y: 1 Vp-p 75 ohms unbalanced, sync negative  
C: 0.286 Vp-p (Burst signal), 75 ohms
- 3) 500mVrms (100% modulation), impedance: 47kilohms
- 4) More than 408 mVrms at the maximum volume setting (variable).  
More than 408 mVrms (fix).

**Television system**

American TV standard/NTSC  
PAL M, N (KV-21FE12A ONLY)

**Channel coverage**

VHF:2-13/UHF:14-69/CATV:1-125

**Visible screen size**

20" picture measured diagonally

**Actual screen size**

21" picture measured diagonally

**Antenna**

75 ohm external antenna terminal for VHF/UHF

**Supplied accessories**

Remote Commander RM-Y168 (KV-20FV12/21FV12/21FV12C ONLY)  
Remote Commander RM-Y172 (KV-21FM12 ONLY)  
Remote Commander RM-Y173 (KV-20FS12/21FE12/21FE12A/21FE12C ONLY)  
Size AA (R6) batteries (2)

**Optional accessories**

Connecting cables: VMC-810S/820S, VMC-720M,  
YC-15V/30V, RK74A  
U/V mixer EAC-66

*Design and specifications are subject to change without notice.*

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## WARNINGS AND CAUTIONS

### CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR CARBON PAINTED ON THE CRT, AFTER REMOVING THE ANODE.

### WARNING!!

AN ISOLATION TRANSFORMER SHOULD BE USED DURING ANY SERVICE TO AVOID POSSIBLE SHOCK HAZARD, BECAUSE OF LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE AC POWER LINE.

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK  $\Delta$  ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS, AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL FOR SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

### ATTENTION!!

APRES AVOIR DECONNECTE LE CAP DE L'ANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

### ATTENTION!!

AFIN D'EVITER TOUT RESQUE D'ELECTROCUTION PROVENANT D'UN CHASSIS SOUS TENSION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISE LORS DE TOUT DEPANNAGE. LE CHASSIS DE CE RECEPTEUR EST DIRECTEMENT RACCORDE A L'ALIMENTATION SECTEUR.

### ATTENTION AUX COMPOSANTS RELATIFS A LA SECURITE!!

LES COMPOSANTS IDENTIFIES PAR UNE TRAME ET PAR UNE MARQUE  $\Delta$  SUR LES SCHEMAS DE PRINCIPE, LES VUES EXPLOSEES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SECURITE DU FONCTIONNEMENT. NE LES REMPLACER QUE PAR DES COMPOSANTS SONY DONT LE NUMERO DE PIECE EST INDIQUE DANS LE PRESENT MANUEL OU DANS DES SUPPLEMENTS PUBLIES PAR SONY. LES REGLAGES DE CIRCUIT DONT L'IMPORTANCE EST CRITIQUE POUR LA SECURITE DU FONCTIONNEMENT SONT IDENTIFIES DANS LE PRESENT MANUEL. SUIVRE CES PROCEDURES LORS DE CHAQUE REMPLACEMENT DE COMPOSANTS CRITIQUES, OU LORSQU'UN MAUVAIS FONTIONNEMENT SUSPECTE.

## SELF-DIAGNOSTIC FUNCTION

The units in this manual contain a self-diagnostic function. If an error occurs, the STANDBY/TIMER LED will automatically begin to flash. The number of times the LED flashes translates to a probable source of the problem. A definition of the STANDBY/TIMER LED flash indicators is listed in the instruction manual for the user's knowledge and reference. If an error symptom cannot be reproduced, the Remote Commander can be used to review the failure occurrence data stored in memory to reveal past problems and how often these problems occur.

### Diagnostic Test Indicators

When an error occurs, the STANDBY/TIMER LED will flash a set number of times to indicate the possible cause of the problem. If there is more than one error, the LED will identify the first of the problem areas.

Results for all of the following diagnostic items are displayed on screen. No error has occurred if the screen displays a "0".

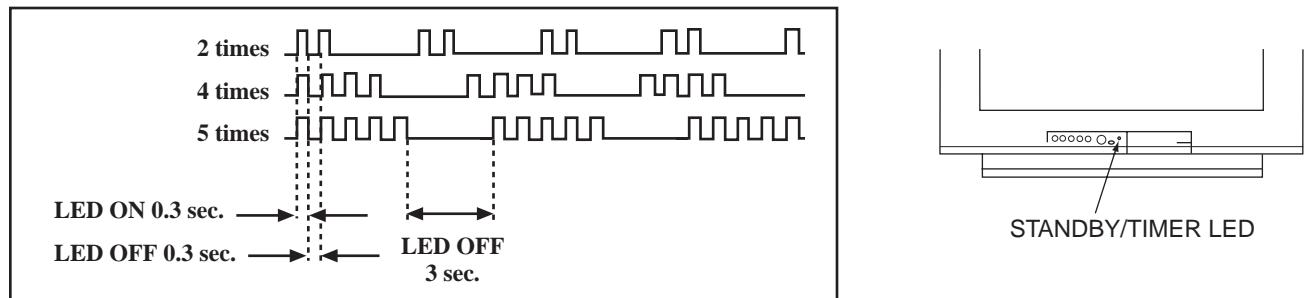
Diagnostic Item Description	No. of Times STANDBY/TIMER LED Flashes	Self-Diagnostic Display/ Diagnostic Result	Probable Cause Location	Detected Symptoms
Power does not turn on	Does not light	_____	<ul style="list-style-type: none"> <li>Power cord is not plugged in.</li> <li>Fuse is burned out. (F601) (A Board)</li> </ul>	<ul style="list-style-type: none"> <li>Power does not come on.</li> <li>No power is supplied to the TV.</li> <li>AC power supply is faulty.</li> </ul>
+B overcurrent (OCP)*	2 times	2:0 or 2:1	<ul style="list-style-type: none"> <li>H.OUT (Q502) is shorted. (A Board)</li> <li>IC702 is shorted. (CB Board)</li> </ul>	<ul style="list-style-type: none"> <li>Power does not come on.</li> <li>Load on power line is shorted.</li> </ul>
Vertical deflection stopped*	4 times	4:0 or 4:1	<ul style="list-style-type: none"> <li>+12V is not supplied. (A Board)</li> <li>IC502 is faulty. (A Board)</li> </ul>	<ul style="list-style-type: none"> <li>Has entered standby state after horizontal raster.</li> <li>Vertical deflection pulse is stopped.</li> <li>Power line is shorted or power supply is stopped.</li> </ul>
White balance failure (not balanced)	5 times	5:0 or 5:1	<ul style="list-style-type: none"> <li>Video OUT (IC502) is faulty. (A Board)</li> <li>IC1301 is faulty. (MB Board)</li> <li>Screen (G2) is improperly adjusted.**</li> </ul>	<ul style="list-style-type: none"> <li>No raster is generated.</li> <li>CRT cathode current detection reference pulse output is small.</li> </ul>

\* If a +B overcurrent is detected, stoppage of the vertical deflection is detected simultaneously.

The symptom that is diagnosed first by the microcontroller is displayed on the screen.

\*\* Refer to Screen (G2) Adjustments in Section 3-4 of this manual.

## Display of Standby/Timer LED Flash Count



### Diagnostic Item      Flash Count\*

+B overcurrent	2 times
Vertical deflection stopped	4 times
White balance failure	5 times

\*One flash count is not used for self-diagnostic.

## Stopping the Standby/Timer LED Flash

Turn off the power switch on the TV main unit or unplug the power cord from the outlet to stop the STANDBY/TIMER LAMP from flashing.

## Self-Diagnostic Screen Display

For errors with symptoms such as "power sometimes shuts off" or "screen sometimes goes out" that cannot be confirmed, it is possible to bring up past occurrences of failure on the screen for confirmation.

### To Bring Up Screen Test

In standby mode, press buttons on the Remote Commander sequentially, in rapid succession, as shown below:

Display → Channel [5] → Sound volume [−] → Power ON



Note that this differs from entering the service mode (sound volume [+]).

## Self-Diagnostic Screen Display

SELF DIAGNOSTIC		
2:	0	Numeral "0" means that no fault was detected.
3:	N/A	
4:	0	
5:	1	Numeral "1" means a fault was detected one time only.
101:	N/A	
	0	

## Handling of Self-Diagnostic Screen Display

Since the diagnostic results displayed on the screen are not automatically cleared, always check the self-diagnostic screen during repairs. When you have completed the repairs, clear the result display to "0".

Unless the result display is cleared to "0", the self-diagnostic function will not be able to detect subsequent faults after completion of the repairs.

### Clearing the Result Display

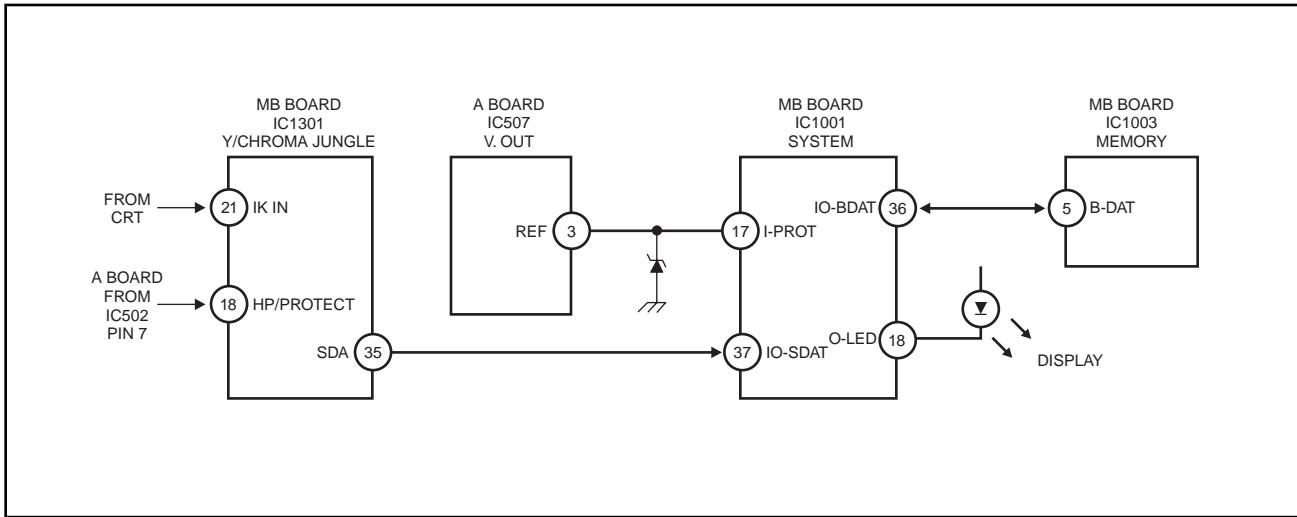
To clear the result display to "0", press buttons on the Remote Commander sequentially when the diagnostic screen is displayed, as shown below:

Channel **[8]** → **[ENTER]**

### Quitting the Self-Diagnostic Screen

To quit the entire self-diagnostic screen, turn off the power switch on the Remote Commander or the main unit.

## Self-Diagnostic Circuit



### +B overcurrent (OCP)

Occurs when an overcurrent on the +B (135V) line is detected by pin 18 of IC1301 (MB Board). If the voltage of pin 18 of IC1301 (MB Board) is less than 1V when V.SYNC is more than seven verticals in a period, the unit will automatically turn off.

### Vertical deflection stopped

Occurs when an absence of the vertical deflection pulse is detected by pin 17 of IC1001 (MB Board). Power supply will shut down when waveform interval exceeds 2 seconds.

### White balance failure

If the RGB levels\* do not balance within 2 seconds after the power is turned on, this error will be detected by IC1301 (MB Board). TV will stay on, but there will be no picture.

\*(Refers to the RGB levels of the AKB detection Ref pulse that detects 1K).

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or touching high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cords for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the B+ and HV to see if they are specified values. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
8. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### Leakage Test

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instructions.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low voltage scale. The Simpson's 250 and Sanwa SH-63TRD are examples of passive VOMs that are suitable. Nearly all battery-operated digital multimeters that have a 2 VAC range are suitable (see Figure A).

### How to Find a Good Earth Ground

A cold-water pipe is a guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60- to 100-watt trouble-light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side on the line; the lamp should light at normal brilliance if the screw is at ground potential (see Figure B).

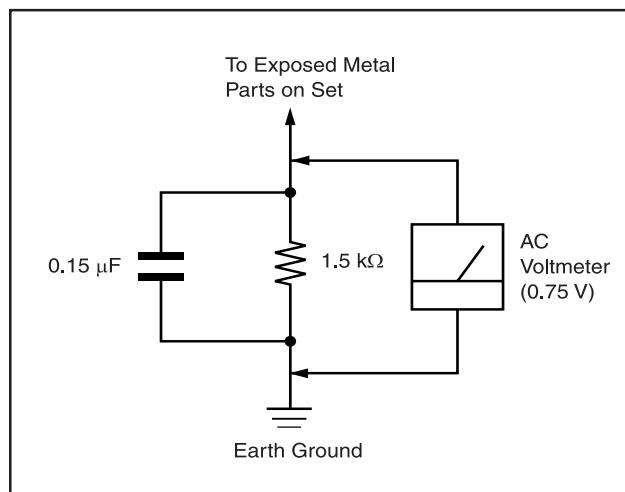


Figure A. Using an AC voltmeter to check AC leakage.

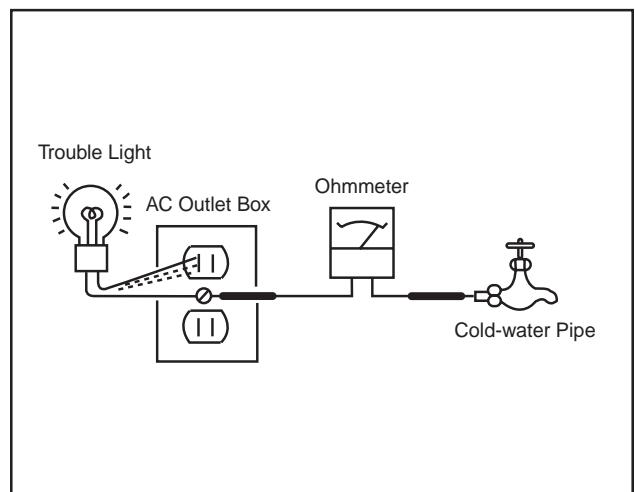


Figure B. Checking for earth ground.

## SECTION 1 GENERAL

The instructions mentioned here are partial abstracts from the Operating Instruction Manual.  
The page numbers shown reflect those of the Operating Instruction Manual.

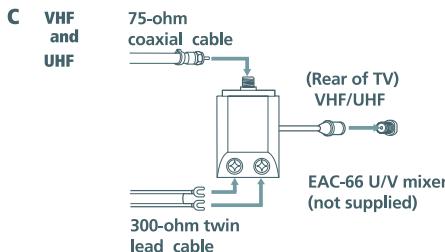
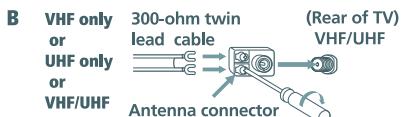
# Connecting Your TV

Read this section before setting up your TV for the first time. This section covers basic connections in addition to any optional equipment you may be connecting.

## Basic Connections

### TV with indoor or outdoor antenna, or CATV cable

Depending on the cable available in your home, choose one of the connections below:

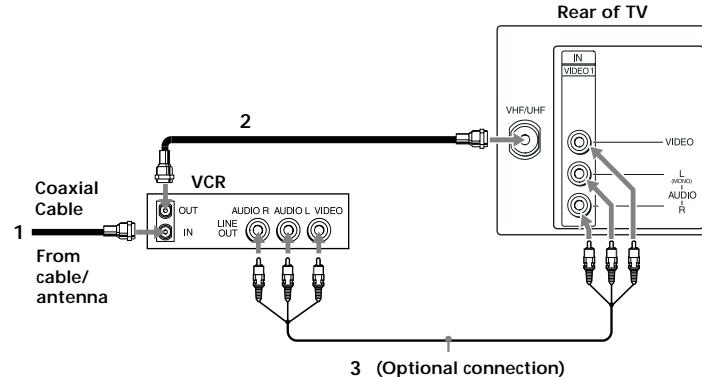


If you are connecting to an indoor or outdoor antenna, you may need to adjust the orientation of the antenna for best reception.

## Operating Instructions

# Connecting Additional Equipment

## TV and VCR



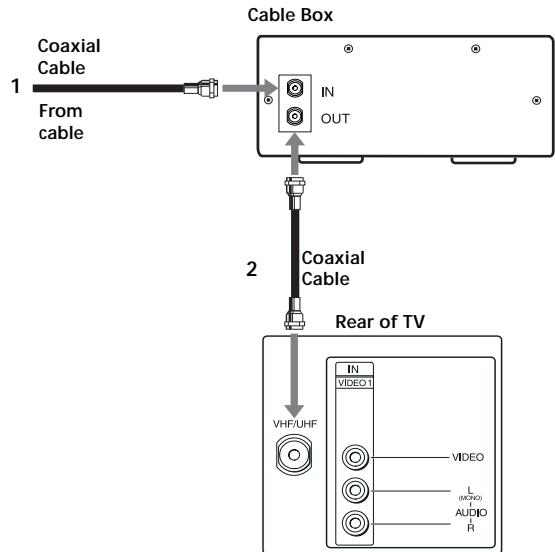
- 1 Connect the coaxial cable from your TV antenna or cable service to the IN jack on your VCR.
- 2 Connect a coaxial cable (not supplied) from the OUT jack on your VCR to the VHF/UHF jack on the TV.

To watch video programs from your VCR, tune your TV to channel 3 or 4 (as set on the rear of your VCR).

### (Optional connection)

- 3 If your VCR is equipped with video outputs, you can get better picture quality by connecting A/V cables (not supplied) from AUDIO and VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.

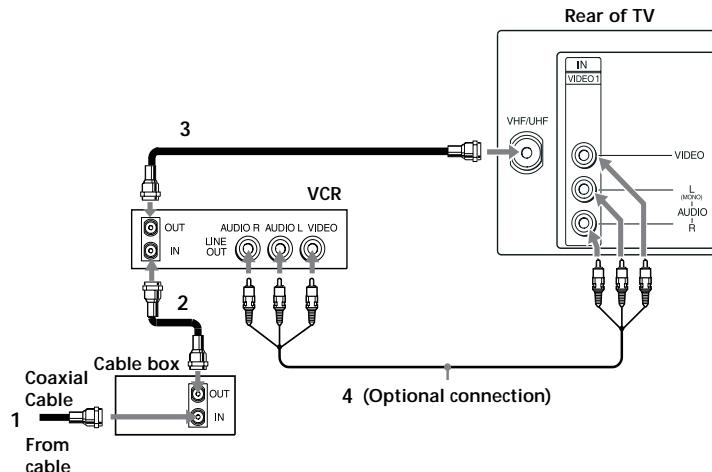
You can use the button to switch between the VHF/UHF and VIDEO inputs.

**TV and Cable Box**

- 1 Connect the coaxial cable from your cable service to the IN jack on your cable box.
- 2 Connect a coaxial cable (not supplied) from the OUT jack on your cable box to the VHF/UHF jack on the TV.

To view channels from your cable box, tune your TV to channel 3 or 4 (as set on the rear panel of your cable box) and use the cable box's remote control to change channels.

If you will be controlling all channel selection through your cable box, you should consider using the Channel Fix feature, (see page 19).

**TV, VCR, and Cable box**

- 1 Connect the coaxial cable from your cable service to the IN jack on your cable box.
- 2 Connect a coaxial cable (not supplied) from the OUT jack on your cable box to the IN jack on your VCR.
- 3 Connect a coaxial cable (not supplied) from the OUT jack on your VCR to the VHF/UHF jack on the TV.

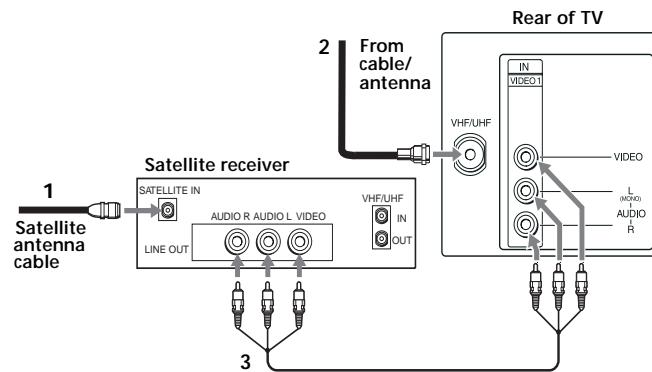
If you will be controlling all channel selection through your cable box, you should consider using the Channel Fix feature, (see page 19).

**(Optional connection)**

- 4 If your VCR is equipped with video outputs, you can get better picture quality by connecting A/V cables (not supplied) from AUDIO and VIDEO OUT on your VCR to AUDIO/VIDEO IN on your TV.

You can use the button to switch between the VHF/UHF and VIDEO inputs.

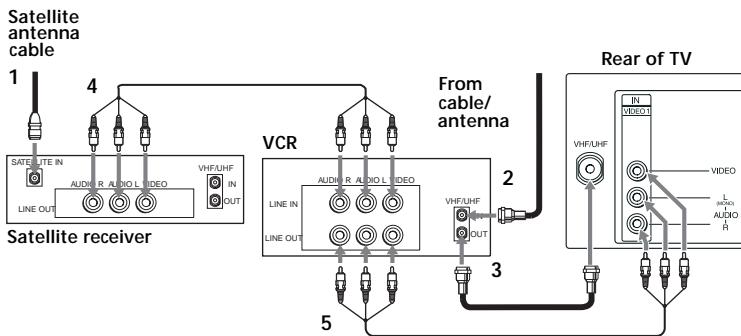
## TV and Satellite Receiver



- 1 Connect the cable from your satellite antenna to SATELLITE IN on your satellite receiver.
- 2 Connect the coaxial cable from your cable service or antenna to the VHF/UHF jack on your TV.
- 3 Using A/V cables, connect AUDIO and VIDEO OUT on your satellite receiver to AUDIO and VIDEO IN on your TV.

You can use the **TV/VIDEO** button to switch between the VHF/UHF and VIDEO inputs.

## TV, Satellite Receiver, and VCR



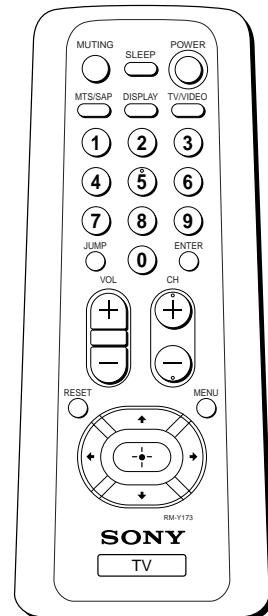
- 1 Connect the cable from your satellite antenna to SATELLITE IN on your satellite receiver.
- 2 Connect the coaxial cable from your cable service or antenna to the IN jack on your VCR.
- 3 Using a coaxial cable, connect the OUT jack on your VCR to the VHF/UHF jack on your TV.
- 4 Using A/V cables, connect AUDIO and VIDEO OUT on your satellite receiver to AUDIO and VIDEO IN on your VCR.
- 5 Using A/V cables, connect AUDIO and VIDEO OUT on your VCR to AUDIO and VIDEO IN on your TV.

To view from the satellite receiver or VCR, select the video input to which your VCR is connected by pressing **TV/VIDEO** on the remote control.

# Using the Remote Control and Basic Functions

This section shows you how to use the more advanced buttons on the remote control and how to use the on-screen menus.

## Using the Remote Control



Button	Description
<b>POWER</b>	Press when you want to turn the TV on and off.
<b>MUTING</b>	Instantly turns off the sound. Press again or press  to restore sound.
<b>TV/VIDEO</b>	Cycles through available video inputs.
	Moves the cursor in the on-screen menus. Press the arrow buttons to move the cursor. Press the center button to select or access an option.
<b>SLEEP</b>	Turns the TV off automatically in approximately 15, 30, 45, 60, or 90 minutes. Cancel by pressing until SLEEP OFF appears.
<b>MTS/SAP</b>	Cycles through the Multi-channel TV Sound (MTS) options: Stereo, Mono, and Auto-SAP (Second Audio Programming) (KV-21FE12 models only).
<b>DISPLAY</b>	Press to display the current time, (if set) and channel number.
<b>JUMP</b>	Alternates between the last two channels selected with the <b>①-⑨</b> buttons.

The remote control illustrated (RM-Y173) is for KV-21FE12 models. For KV-21FM12 and KV-14FM12 models, your remote control does not have the MTS/SAP button.

## Operating Instructions

<b>MENU</b>	Displays the on-screen menu. Press again to exit the menu at any time.
<b>RESET</b>	Press to return to factory settings while in an on-screen menu.

# Other Information

## Troubleshooting

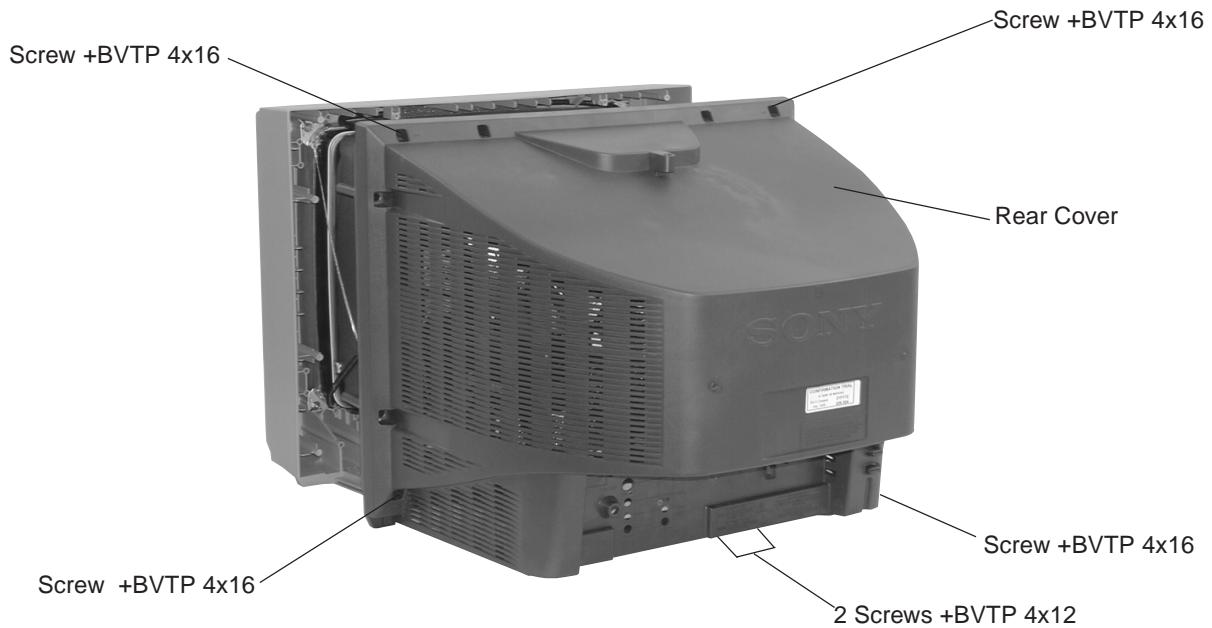
If you are having a problem with your TV, try the suggestions below. If the problem persists, contact your nearest Sony dealer.

<b>No picture, no sound</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure the power cord is plugged in.</li> <li><input type="checkbox"/> If a red light is flashing on the front of your TV for more than a few minutes, disconnect and reconnect the power cord to restore the TV. If the problem continues, call your local service center.</li> <li><input type="checkbox"/> Check the TV/VIDEO settings: when watching TV, set to TV; when watching video equipment, set to VIDEO (page 11).</li> <li><input type="checkbox"/> Make sure the batteries have been inserted correctly into the remote control.</li> <li><input type="checkbox"/> Try another channel, it could be station trouble.</li> </ul>
<b>Poor or no picture, good sound</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Adjust Picture in the Video menu (page 17).</li> <li><input type="checkbox"/> Adjust Brightness in the Video menu (page 17).</li> <li><input type="checkbox"/> Check the antenna and/or cable connections (page 3).</li> </ul>
<b>Good picture, no sound</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Press  so that MUTING disappears from the screen (page 11).</li> <li><input type="checkbox"/> Check your Audio settings. Your TV may be set to Auto-SAP (page 18).</li> </ul>
<b>No color</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Adjust Color in the Video menu (page 17).</li> </ul>
<b>No signal</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check the Cable setting in the Options menu under Setup (page 23).</li> <li><input type="checkbox"/> Check the antenna and/or cable connections (page 3).</li> <li><input type="checkbox"/> Make sure the channel selected is currently broadcasting.</li> </ul>
<b>Dotted lines or stripes</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Adjust the antenna.</li> <li><input type="checkbox"/> Move the TV away from other electronic equipment. Some electronic equipment can create electrical noise, which can interfere with TV reception.</li> </ul>
<b>Double images or ghosts</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Check your outdoor antenna or call your cable service.</li> </ul>

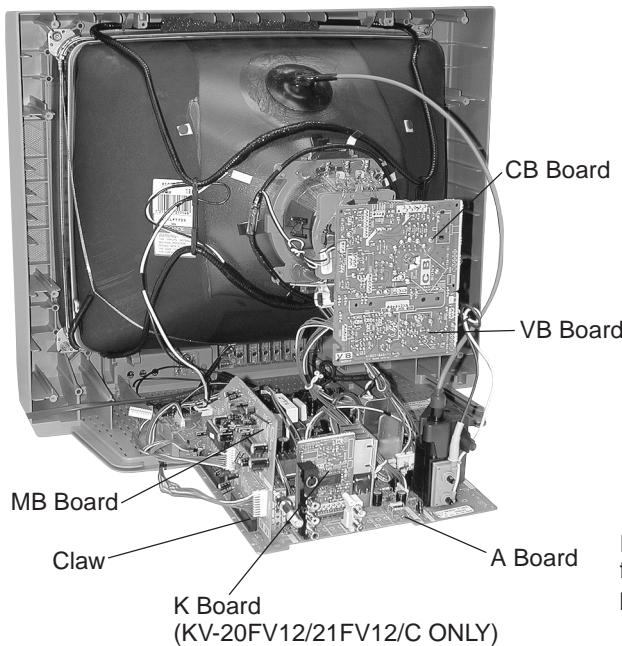
<b>Cannot receive higher number channels (UHF) when using an antenna</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure Cable is set to OFF in the Options menu under Setup (page 23).</li> <li><input type="checkbox"/> Perform Auto Program to add channels that are not presently in the memory (page 23).</li> </ul>
<b>Cable stations don't seem to work</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Make sure Cable is set to ON in the Options menu under Setup (page 23).</li> <li><input type="checkbox"/> Perform Auto Program to add channels that are not presently in the memory (page 23).</li> </ul>
<b>Remote control does not operate</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Batteries could be weak. Replace them (page 2).</li> <li><input type="checkbox"/> Move the TV 3-4 feet or more away from fluorescent lights.</li> </ul>
<b>The TV needs to be cleaned</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Clean the TV with a soft dry cloth. Never use strong solvents such as thinner or benzine, which might damage the finish of the cabinet.</li> </ul>

## SECTION 2 DISASSEMBLY

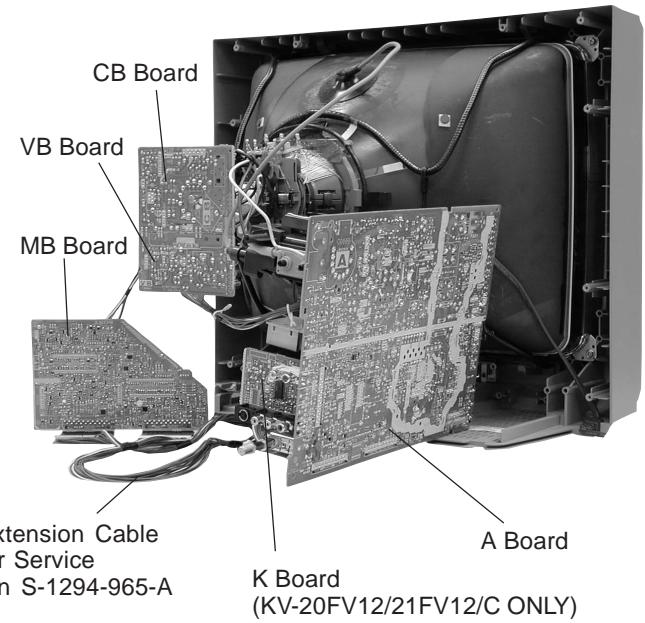
### 2-1. REAR COVER REMOVAL



### 2-2. CHASSIS ASSEMBLY REMOVAL



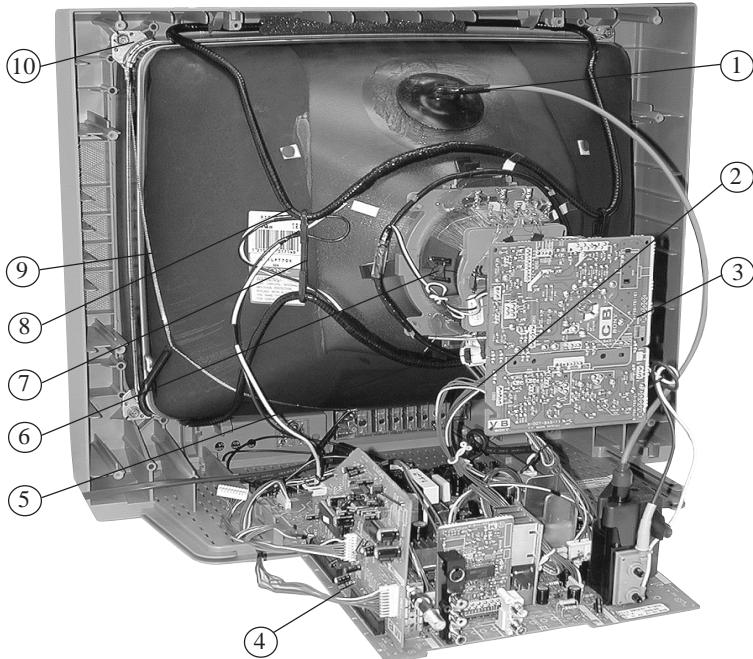
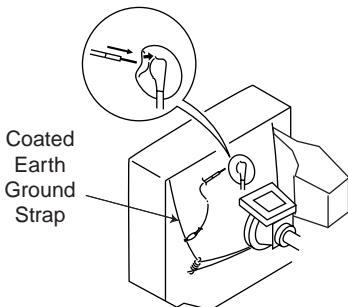
### 2-3. SERVICE POSITION



## 2-4. PICTURE TUBE REMOVAL

### WARNING: BEFORE REMOVING THE ANODE CAP

High voltage remains in the CRT even after the power is disconnected. To avoid electric shock, discharge CRT **before** attempting to remove the anode cap. Short between anode and CRT coated earth ground strap.



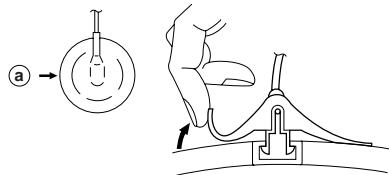
1. Discharge the anode of the CRT and remove the anode cap.
2. Unplug all interconnecting leads from the deflection yoke, neck assembly, degaussing coils and CRT grounding strap.
3. Remove the CB Board from the CRT.
4. Remove the chassis assembly.
5. Loosen the neck assembly fixing screw and remove.
6. Loosen the deflection yoke fixing screw and remove.
7. Place the set with the CRT face down on a cushion and remove the degaussing coil holders.
8. Remove the degaussing coils.
9. Remove the CRT grounding strap and spring tensioners.
10. Unscrew the four CRT fixing screws [located on each CRT corner] and remove the CRT [Take care not to handle the CRT by the neck].

### ANODE CAP REMOVAL

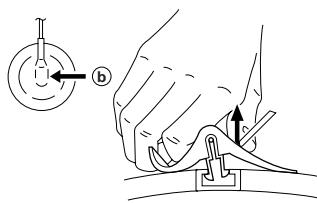
**WARNING:** High voltage remains in the CRT even after the power is disconnected. To avoid electrical shock, discharge the CRT **before** attempting to remove the anode cap. Short between anode and coated earth ground strap of CRT.

**NOTE:** After removing the anode, short circuit the anode of the picture tube and the anode cap to either the metal chassis, CRT shield, or carbon painted on the CRT.

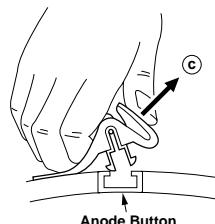
### REMOVAL PROCEDURES



① Turn up one side of the rubber cap in the direction indicated by arrow ①.



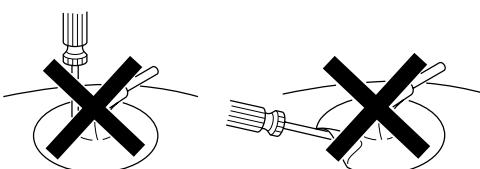
② Use your thumb to pull the rubber cap firmly in the direction indicated by arrow ②.



③ When one side of the rubber cap separates from the anode button, the anode cap can be removed by turning the rubber cap and pulling it in the direction of arrow ③.

### HOW TO HANDLE AN ANODE CAP

- ① Do not use sharp objects which may cause damage to the surface of the anode cap.
- ② To avoid damaging the anode cap, do not squeeze the rubber covering too hard. A material fitting called a shatter-hook terminal is built into the rubber.
- ③ Do not force turn the foot of the rubber cover. This may cause the shatter-hook terminal to protrude and damage the rubber.



## SECTION 3

### SET-UP ADJUSTMENTS

The following adjustments should be made when a complete realignment is required or when a new picture tube is installed.

These adjustments should be performed with rated power supply voltage unless otherwise noted.

Set the controls as follows unless otherwise noted:

VIDEO MODE: STANDARD

PICTURE control: ..... Normal

BRIGHTNESS control: ..... Normal

Perform the adjustments in order as follows:

1. Beam Landing
2. Convergence
3. Focus
4. Screen (G2)
5. White Balance

**Note:** Test equipment required:

- Color Bar Pattern Generator
- Degausser
- DC Power Supply
- Digital Multimeter

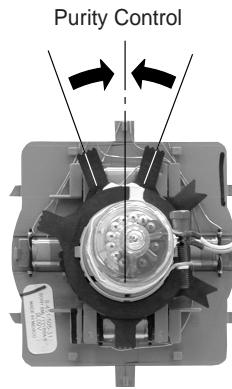
#### 3-1. BEAM LANDING

Before beginning adjustment procedure:

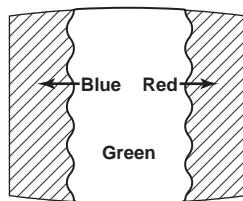
1. Degauss the entire screen.
2. Feed in the white pattern signal.

#### Adjustment Procedure

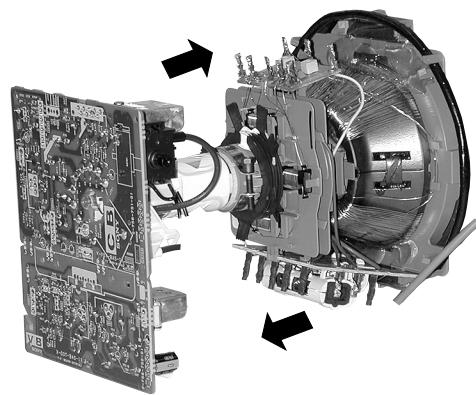
1. Input a raster signal with the pattern generator.
2. Loosen the deflection yoke mounting screw and set the purity control to the center as shown below.



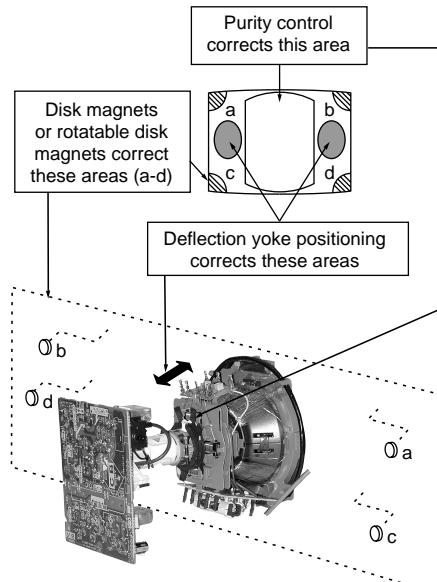
3. Turn the raster signal of the pattern generator to green.
4. Move the deflection yoke backward and adjust the purity control so that green is in the center and red and blue are at the sides evenly.



5. Move the deflection yoke forward and adjust so that the entire screen becomes green.



6. Switch over the raster signal to red and blue and confirm the condition.
7. When the position of the deflection yoke is determined, tighten it with the deflection yoke mounting screw.
8. If landing at the corner is not right, adjust by using the disk magnets.



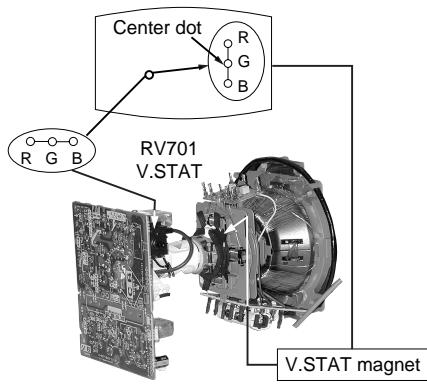
### 3-2. CONVERGENCE

Before starting convergence adjustments:

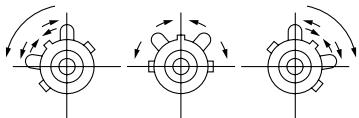
1. Perform FOCUS, V.LIN AND V.SIZE adjustments.
2. Set BRIGHTNESS control to minimum.
3. Feed in dot pattern.

### Vertical Static Convergence

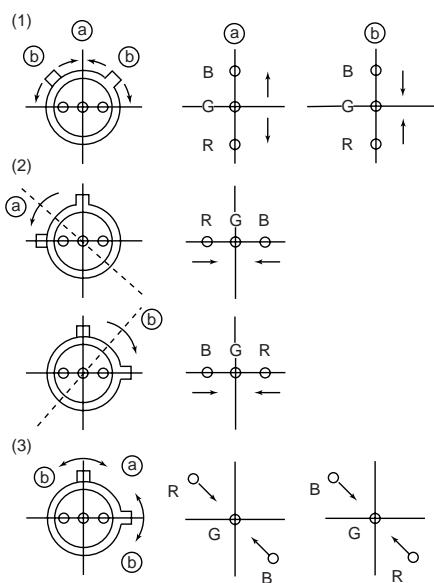
1. Adjust V.STAT magnet to converge red, green and blue dots in the center of the screen (Vertical movement adjust V.STAT RV to converge).



2. Tilt the V.STAT magnet and adjust static convergence to open or close the V.STAT magnet.



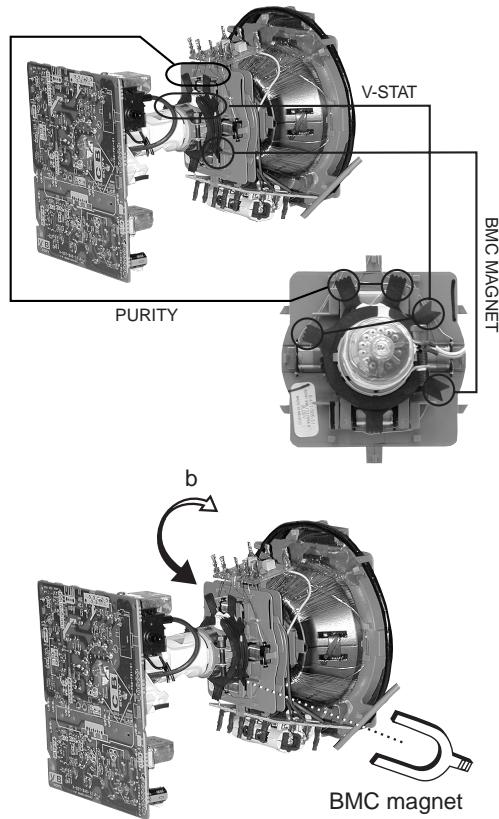
When the V.STAT magnet is moved in the direction of arrows a and b, red, green, and blue dots move as shown below:



### Horizontal Static Convergence

If the blue dot does not converge with the red and green dots, perform the following:

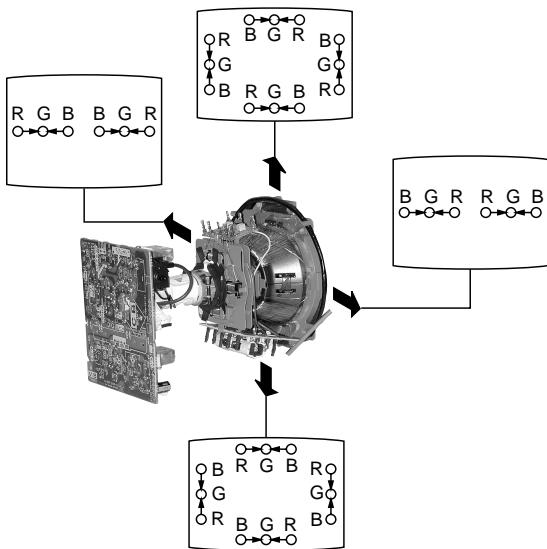
1. Move BMC magnet (a) to correct insufficient H. Static convergence.
2. Rotate BMC magnet (b) to correct insufficient V. Static convergence.
3. After adjusting the BMC magnet, repeat Beam Landing Adjustment.



### Dynamic Convergence Adjustment

Before performing this adjustment, perform Horizontal and Vertical Static Convergence Adjustment.

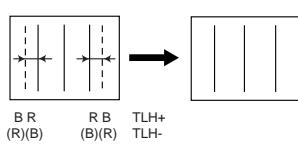
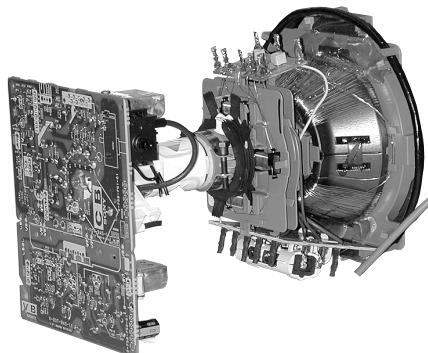
1. Slightly loosen deflection yoke screw.
2. Remove deflection yoke spacers.
3. Move the deflection yoke for best convergence as shown on the following page.



4. Tighten the deflection yoke screw.
5. Install the deflection yoke spacers.

### TLH Plate Adjustment

1. Input crosshatch pattern.
2. Adjust PICTURE QUALITY to standard, PICTURE and BRIGHTNESS to 50%, and OTHER to standard.
3. Adjust the Horizontal Convergence of red and blue dots by tilting the TLH plate on the deflection yoke.



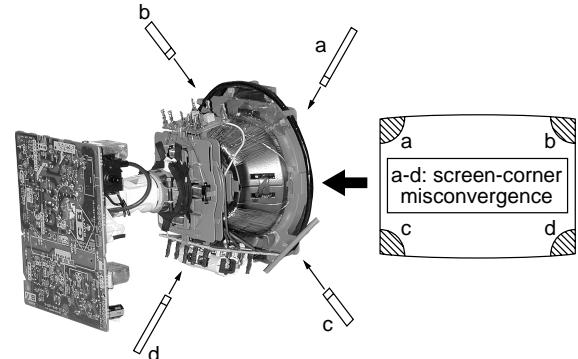
4. Adjust XCV core to balance X axis.
5. Adjust YCH VR to balance Y axis.

6. Adjust vertical red and blue convergence with V.TILT (TLV VR).

Perform adjustments while tracking items 1 and 2.

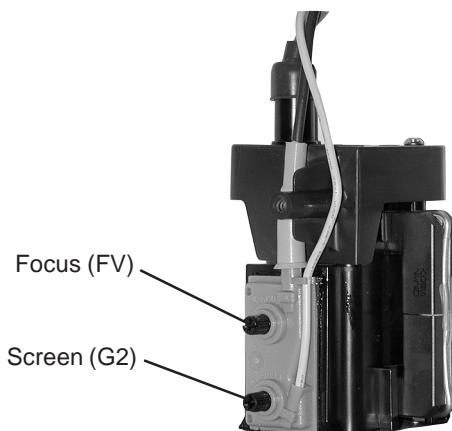
### Screen-Corner Convergence

1. Affix a permalloy assembly corresponding to the misconverged areas.



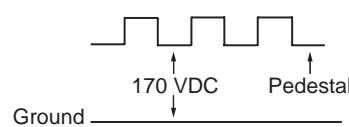
### 3-3. FOCUS

1. Adjust FOCUS control for best picture.



### 3-4. SCREEN (G2)

1. Input a dots pattern.
2. Set the PICTURE and BRIGHTNESS controls at minimum and COLOR control at normal.
3. Adjust SBRT, GCUT, BCUT in service mode with an oscilloscope as shown below so that voltages on the red, green, and blue cathodes are 170 VDC.



4. Observe the screen and adjust SCREEN (G2) VR in FBT to obtain the faintly visible background of dot signal.

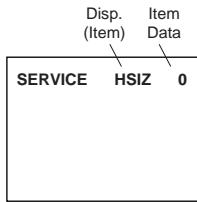
### 3-5. METHOD OF SETTING THE SERVICE ADJUSTMENT MODE

#### Service Mode Procedure

1. Standby mode (power off).
2. **Display** → Channel **5** → Sound volume **+** → Power on the Remote Commander (press each button within a second).

#### Service Adjustment Mode In

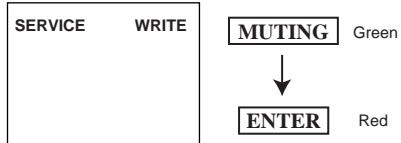
1. The CRT displays the item being adjusted.



2. Press **1** or **4** on the Remote Commander to select the item.
3. Press **3** or **6** on the Remote Commander to change the data.
4. Press **MUTING** then **ENTER** to save into the memory.

#### Service Adjustment Mode Memory

Turn set off then on to exit service adjustment mode.



### 3-6. WHITE BALANCE ADJUSTMENTS

1. Input an entire white signal with burst.
2. Set to Service Adjustment Mode.
3. Set DCOL to "0".
4. Set the PICTURE and BRIGHTNESS to minimum.
5. Adjust with SBRT if necessary.
6. Select GCUT and BCUT with **1** and **4**.
7. Adjust with **3** and **6** for the best white balance.
8. Set PICTURE and BRIGHTNESS to maximum.
9. Select GDRV and BDRV with **1** and **4**.
10. Adjust with **3** and **6** for the best white balance.
11. Reset DCOL to "1".
12. To write into memory, press **MUTING** then **ENTER**.

## SECTION 4

### SAFETY RELATED ADJUSTMENTS

#### 4-1. R562 CONFIRMATION METHOD (HV HOLD-DOWN CONFIRMATION) AND READJUSTMENTS

The following adjustments should always be performed when replacing the following components which are marked with  on the schematic diagram:

Part Replaced ( <input checked="" type="checkbox"/> )	Adjustment ( <input checked="" type="checkbox"/> )
DY, T505, CRT, IC1301, IC501, C507, C520, C505, C509, C515, T504, L508, C551, L510, C546, C537, C547, D517, D518, D519, R560, R561, R562, R563, R565, R566, R567, R525 .....A Board	HV HOLD-DOWN R562

#### Preparation Before Confirmation

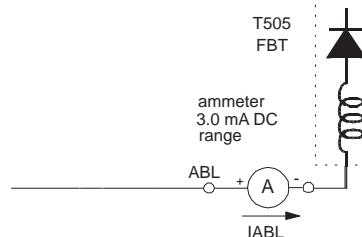
1. Using a Variac, apply AC input voltage:  $120-220 \pm 2$  VAC.
2. Turn the POWER switch ON.
3. Input a white signal and set the PICTURE and BRIGHTNESS controls to maximum.
4. Confirm that the voltage between C546 (+) or TP503 and ground is more than 97 VDC.

#### Hold-Down Operation Confirmation

1. Connect the current meter between Pin 11 of the FBT (T505) and the PWB land where Pin 11 would normally attach. (See Figure 1 on the next page.)
2. Input a dot signal and set PICTURE and BRIGHTNESS to minimum:  $IABL = 100 \pm 100 \mu A$ .
3. Confirm the voltage of A Board TP-600 is  $135 \pm 1$  VDC.
4. Connect the digital voltmeter and the DC power supply via diode 1SS119 to C546 (+) and ground. (See Figure 1 on the next page.)
5. Increase the DC power voltage gradually until the picture blanks out.
6. Turn DC power source off immediately.
7. Read the digital voltmeter indication (standard  $< 115.7$  VDC).
8. Input a white signal and set PICTURE and BRIGHTNESS to maximum:  $IABL = 1350 \pm 100 \mu A$ .
9. Repeat steps 4 to 7.

#### Hold-Down Readjustment

If the setting indicated in step 2 of Hold-Down Operation Confirmation cannot be met, readjustment should be performed by altering the resistance value of R562 component marked with .



#### 4-2. B+ VOLTAGE CONFIRMATION AND ADJUSTMENT

Note: The following adjustments should always be performed when replacing the following components, which are marked with  on the schematic diagram on the A Board.

**A BOARD:** IC601, PH601

1. Using a Variac, apply AC input voltage:  $130 \pm 2$  VAC.
2. Input a dot signal.
3. Set the PICTURE and BRIGHTNESS controls to minimum.
4. Confirm that the voltage of A Board TP-600 is  $< 136$  VDC.
5. If step 3 is not satisfied, replace the components listed above, then repeat steps 1–3.

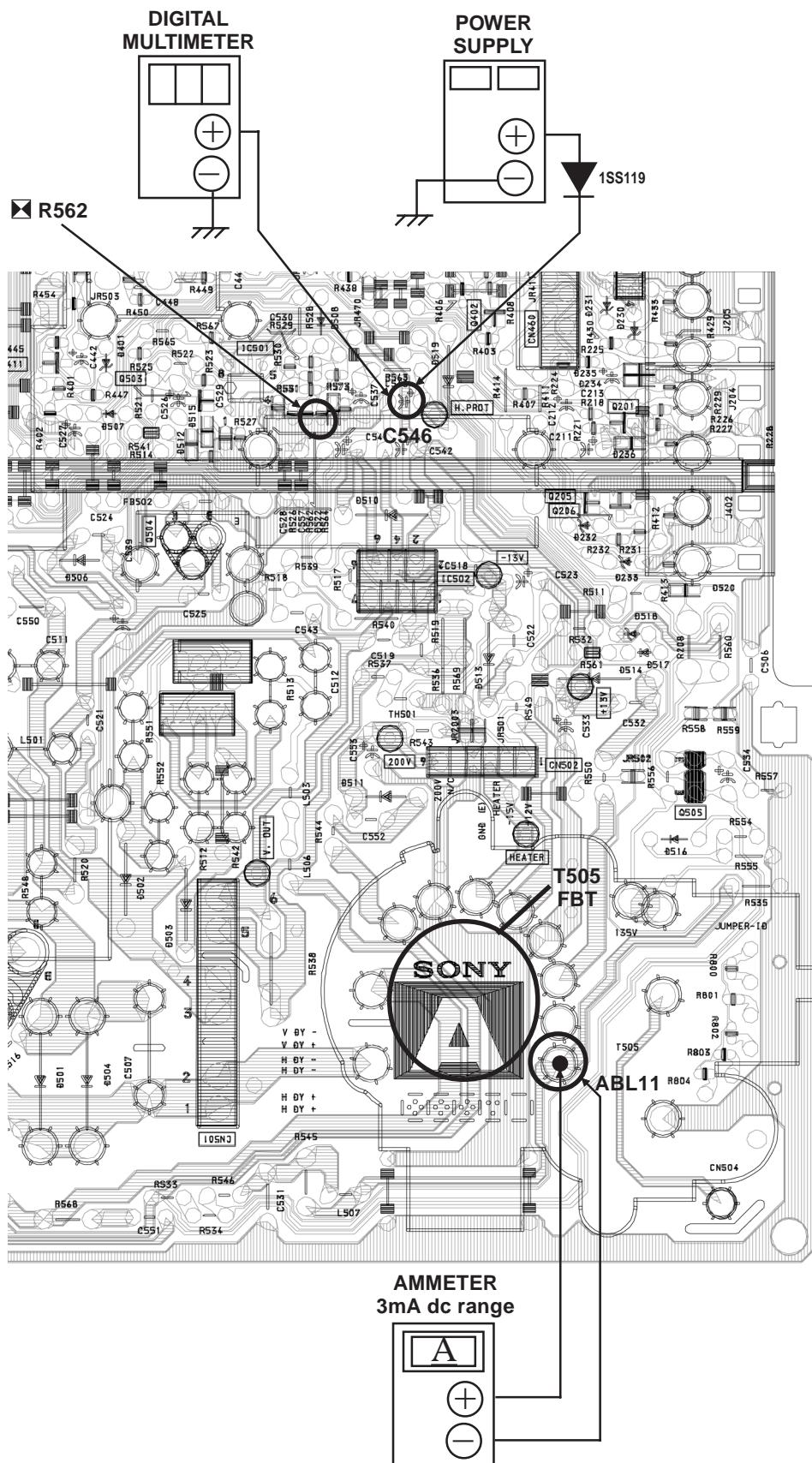


Figure 1

## SECTION 5

### CIRCUIT ADJUSTMENTS

#### ELECTRICAL ADJUSTMENTS BY REMOTE COMMANDER

Use the Remote Commander (RM-Y168, RM-Y172 or RM-Y173) to perform the circuit adjustments in this section.

NOTE: Test Equipment Required:

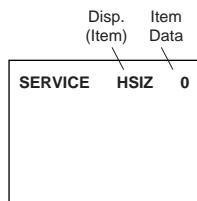
- Pattern generator
- Frequency counter
- Digital multimeter
- Audio oscillator

#### 5-1. SETTING THE SERVICE ADJUSTMENT MODE

1. Standby mode (power off).
2. **Display** → Channel **5** → Sound volume **+** → Power on the Remote Commander (press each button within a second).

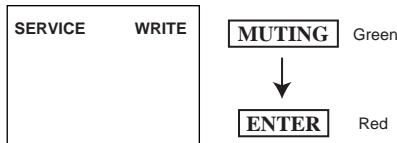
#### Service Adjustment Mode On

1. The CRT displays the item being adjusted.

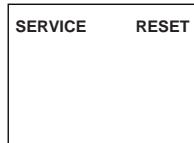


2. Press **1** or **4** on the Remote Commander to select an item.
3. Press **3** or **6** on the Remote Commander to change the data.
4. Press **MUTING** then **ENTER** to save into the memory.

#### Service Adjustment Mode Memory



1. Press **8** then **ENTER** on the Remote Commander to initialize.



Carry out step 1 when adjusting IDs 0–4 and when replacing and adjusting IC1003.

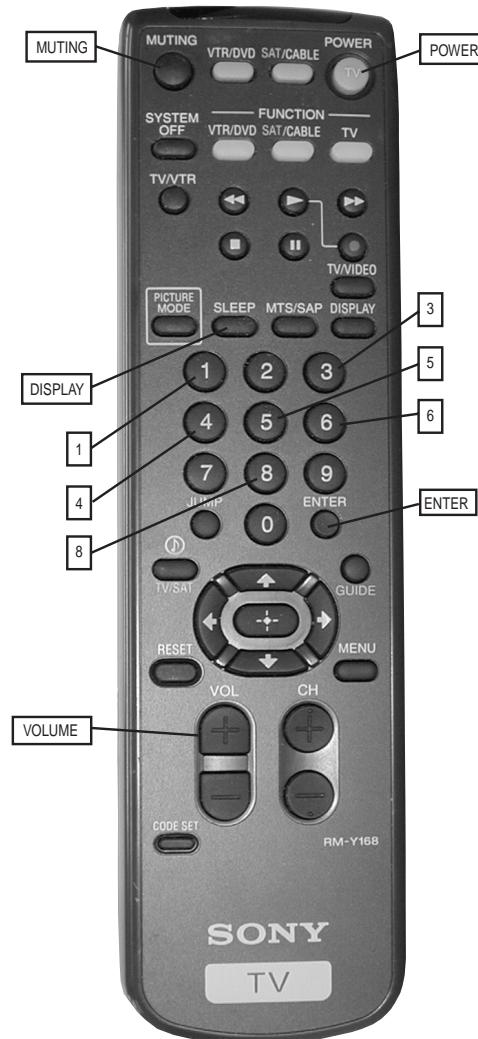
2. Turn set off then on to exit service adjustment mode.

#### 5-2. MEMORY WRITE CONFIRMATION METHOD

1. After adjustment, remove the power plug from the AC outlet, then plug it in again.
2. Turn the power switch ON and set to service mode.
3. Call the adjusted items again to confirm they were adjusted.

#### 5-3. ADJUSTMENT BUTTONS AND INDICATORS

(Use remote commander RM-Y168, RM-Y172 or RM-Y173.)



RM-Y168

## Adjustment Items

Reg #	ITEM	FUNCTION	RANGE	FIX DATA	NTSC	PAL M	PAL N	VIDEO	RF	AVERAGE DATA
1	HSIZ	Horizontal Size Adjustment	0-63		35	35	35			40
2	HPOS	Horizontal Position Adjustment	0-63		33	33	33			25
3	VBOW	Vertical Line Bowing Adj.	0-15		5	5	5			7
4	VANG	Vertical line Bowing Slant Adj.	0-15		7	7	7			9
5	TRAP	Horizontal Trapezoid Adj.	0-15		7	7	7			7
6	PAMP	Horizontal PIN Distortion Adj.	0-63		7	7	7			12
7	UPIN	Upper PIN Distortion Adj.	0-63		36	36	36			34
8	LPIN	Lower PIN Distortion Adj.	0-63		36	36	36			37
9	VM	Velocity Modulation On/Off	0,1		Palette mode controls this register					0
10	BLKO	Vertical Blanking On/Off	0,1	0						0
11	VMLV	Velocity Modulation Level	0-3		Palette mode controls this register					2
12	AGN2	Aging 2	0,1	0						0
13	REFP	Reference Pulse Position	0,1	0						0
14	VBLK	Vertical Blanking On/Off	0,3	0						0
15	JPSW		0,1	0						0
16	VSIZ	Vertical Size Adjustment	0-63		40	47	47			26
17	VPOS	Vertical Position Adj.	0-63		32	32	32			35
18	VLIN	Vertical Linearity Adj.	0-15	7						5
19	SCOR	Vertical "S" Correction Adjustment	0-15	6						4
20	VZOM	16:9 CRT Z Mode On/Off	0,1	0						0
21	EHT	Vertical High-Voltage Correction	0-15	15						15
22	ASP	Aspect Ratio Control	0-63	47						47
23	SCRL	16:9 CRT Z Mode Trans. Scroll	0-63	31						31
24	HBLK	Horizontal Blanking On/Off	0,1	1						1
25	LBLK	Left Blanking Adjustment	0-15	11						11
26	RBLK	Right Blanking Adjustment	0-15	8						8
27	VUSN	V Saw Waveform Compress	0,1	0						0
28	HDW	Horizontal Drive Pulse Width	0,1	1						1
29	EWDC	"Parabola" EW/ D.C. Adjustment	0,1	0						0
30	LVLN	Lower Screen BTM Vertical Line Adj.	0-15	0						0
31	UVLN	Upper Screen BTM Vertical Line Adj.	0-15	0						0
32	HTRAP	Horizontal Trapezoid Adj.	0,1	****						0
33	RDRV	R Output Drive Control	0-63	31						21
34	GDRV	G Output Drive Control	0-63	21						14
35	BDRV	B Output Drive Control	0-63	21						14
36	RCUT	R Output Cutoff Control	0-15	10						10
37	GCUT	G Output Cutoff Control	0-15	6						7
38	BCUT	B Output Cutoff Control	0-15	6						7
39	DCOL	Dynamic Color On/Off	0,1	0						1
40	SHUE	Sub HUE	0-31	12						14
41	SCOL	Sub Color	0-31		14	14	14			14
42	SBRT	Sub BRIGHTNESS	0-31	13						13
43	RON	R Output On/Off	0,1	1						1
44	GON	G Output On/Off	0,1	1						1
45	BON	B Output On/Off	0,1	1						1
46	AXPL	Axis PAL	0,1	0						0
47	AXNT	Axis NTSC	0,1	0						1
48	CBPF	Chroma BPF On/Off	0,1	1						1
49	CTRP	Y TRAP FILTER On/Off	0,1	1						1
50	COFF	Color On/Off	0,1	0						0
51	KOFF	Set Color Killer	0,1	0						0
52	SSHPS	Sub SHARPNESS	0-15	5						5
53	SHPF	SHARPNESS Circuit Fo	0,1		Palette mode controls this register					1
54	PREL	Pre-Shoot / Over-Shoot	0,1	1						1
55	Y-DC	DC Transmission Ratio Switching	0,1		Palette mode controls this register					1
56	GAMM	Gamma Correction Amnt	0-3		Palette mode controls this register					1
57	ABLM	ABL Mode Switching	0,1	1						1
58	VTH	ABL CD VHT Switching	0,1	1						1
59	YDEL	Y Delay Time Control	0-15	7						7
60	NCOL	No Color ID	0,1	1						1
61	FSC	FSC Out On/Off	0,1	1						1
62	K-ID	Killer ID Control On/Off	0,1	0						0
63	HOSC	Horizontal VCO Oscillation Freq.	0-15	12						12

Reg #	ITEM	FUNCTION	RANGE	FIX DATA	NTSC	PAL M	PAL N	VIDEO	RF	AVERAGE DATA
64	VSS	Vertical Sync Slice Level	0,1	**						0
65	HSS	Horizontal Sync Slice Level	0,1	0						0
66	HMSK		0,1	0						0
67	VTMS	Select Signal VTIM Pin	0-3	0						0
68	CDMD	Vertical Count Down Mode Switching	0-3					3	***	
69	AFC	AFC Loop Gain Switching	0-3	0				0	0	0
70	FIFR	Field Frequency	0-3	*						3
71	SBAL	Sub Balance	0-15	5						7
72	SBAS	Sub Bass	0-7	0						9
73	STRE	Sub Treble	0-7	3						9
74	BBEH	BBE High	0-15	*****						
75	BBEL	BBE Low	0-15	5						12
76	SRND	Surround	0,1	0						13
77	AUX	SRS, Simulated	0-3	0						
78	DISP	O.S.D Display Position	0-130	15						15
79	TROT	Tilt Correction	0-63	31	31					31
80	HCLW	Horizontal Count Lower Limit	0-255	16				16		16
81	HCHG	Horizontal Count High Limit	0-255	64				64		64
82	SYSC	Color System	0-7	4						6
83	VENH	Vertical Enhancement	0-7		Palette mode controls this register					4
84	PDSO		0,1	0						
85	CK		0,1	0						
86	VNL		0-15	3						3
87	HPK		0,1	0						0
88	HPKO		0,1		Palette mode controls this register					
89	CORE		0-3	1						1
90	TRAP		0,1	1						1
91	CHTR		0,1	0						0
92	CHPF		0,1	1						1
93	ENHO		0,1	0						0
94	ID0		0-225	25						SEE ID MAP
95	ID1		0-225	3						SEE ID MAP
96	ID2		0-225	91						SEE ID MAP
97	ID3		0-225	2						SEE ID MAP
98	ID4		0-225	233						SEE ID MAP
99	ID5		0-225	17						SEE ID MAP
100	ID6		0-225	0						SEE ID MAP

\* FIFR = 3 for NTSC models, FIFR=1 for Trinorma models

\*\* VSS = 1 for US &amp; CND, VSS=0 for Other

\*\*\* CDMD = 3 for US &amp; CND, CDMD = 0 for Other

\*\*\*\* KV-21FE12A,KV-21FE12C,KV-21FV12C=1; Others = 0

\*\*\*\*\* BBE HIGH FIX DATA: KV-21FV12/21FV12C= 8; Others = 4

SERVICE ID0 25

Notes:

No. 1-100 show the order that each adjustment mode may be selected while in service mode.

Data Range shows the range of possible settings for each adjustment mode.

Initial Data shows the standard settings for each adjustment mode.

## ID MAP

MODEL	Destination	ID-0	ID-1	ID-2	ID-3	ID-4	ID-5	ID-6
KV-21FM12	(MX)	17	3	88	2	233	17	0
KV-20FS12	(US)	89	3	75	50	137	17	0
KV-20FS12	(CND)	89	3	75	50	137	17	0
KV-21FE12	(E)	17	3	91	2	233	17	0
KV-21FE12A	(E)	23	3	91	2	233	17	128
KV-21FE12C	(E)	17	3	91	2	233	17	0
KV-20FV12	(US)	89	19	207	50	137	19	0
KV-20FV12	(CND)	89	19	207	50	137	19	0
KV-21FV12	(E)	17	19	223	2	233	19	0
KV-21FV12C	(E)	17	19	223	2	233	19	0

## 5-4. MB BOARD ADJUSTMENTS

### H. Frequency (Free Run) Check

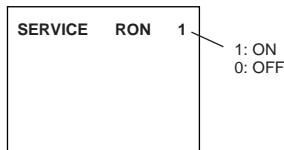
1. Input a TV mode (RF) with no signal.
2. Connect a frequency counter to base of Q501 (TP-500 H. DRIVE).
3. Check H. Frequency for  $15735 \pm 200$  Hz, and  $15650 \pm 200$  Hz for PAL-N (KV-21FE12A ONLY).

### V. Frequency (Free Run) Check

1. Select video 1 with no signal input.
2. Set the conditions for a standard setting.
3. Connect the frequency counter on the A Board to TP-508 (V OUT) or CN 501 pin ⑥ (V DY+) and ground.
4. Check that V. Frequency shows  $60 \pm 4$  Hz for NTSC,  $50 \pm 4$  Hz for PAL-N (KV-21FE12A ONLY).

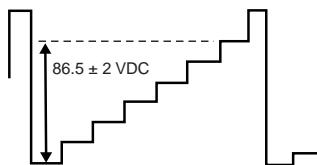
### Drive (RDRV) Adjustments

1. Input a color-bar signal and set the level to 75%.
2. In Standard mode, set PICTURE to maximum and COLOR to minimum.
3. Activate the Service Adjustment Mode.
4. Set both GON and BON items. Using [3] and [6]; set each to the following values. Leave RON set to “1”.



R ON: ON (1)  
G ON: OFF (0)  
B ON: OFF (0)

5. Select the DCOL item and set it to “0”.
6. Connect an oscilloscope probe to C board, J701 pin 12 (KR) (RED OUT).
7. Select RDRV with [1] and [4].
8. Adjust the value of RDRV with [3] and [6] for  $86.5 \pm 2$  VDC.



9. Reset the item DCOL to “1”.
10. Reset GON and BON values to “1”.

R ON: ON (1)  
G ON: ON (1)  
B ON: ON (1)

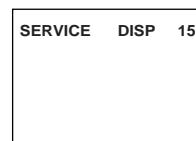
11. Reset Picture and Color to normal values:

PICTURE: MAX  
COLOR: CENTER

12. Press [MUTING] then [ENTER] to save into the memory.

### Display Position Adjustment (DISP)

1. Input a color-bar signal.
2. Set to Service Adjustment Mode.
3. Select DISP with [1] and [4].
4. Adjust values of DISP with [3] and [6] to adjust characters to the center.
5. Write to memory by pressing [MUTING] then [ENTER].
6. Check to see if the text is displayed on the screen.

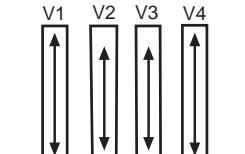


### Sub Bright Adjustment (SBRT)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Set the PICTURE and BRIGHTNESS to minimum.
4. Select the SBRT item with [1] and [4].
5. Adjust the values of SBRT with [3] and [6] to obtain a faintly visible crosshatch.
6. Press [MUTING] then [ENTER] to save into the memory.

### Sub Hue, Sub Color Adjustment (SHUE, SCOL)

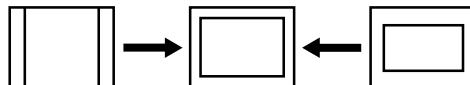
1. Input a color-bar signal and set level to 75%.
2. Activate the Service Adjustment Mode.
3. Select the DCOL item and set the value to “0”.
4. Connect an oscilloscope probe to C Board, CN1752 Pin ④.
5. Select the SHUE and SCOL item with [1] and [4].
6. While showing the SHUE item, adjust the waveform with [3] and [6] until the second and third bars show the same level ( $V2 = V3 \pm 0.2$  Vp-p).
7. While showing the SCOL item, adjust the waveform with [3] and [6] until the first and fourth bars show the same level ( $V1 = V4 \pm 0.2$  Vp-p).
8. Input RF PAL-M and PAL-N color-bar and repeat steps 1-7 for each. (KV-21FC12A ONLY).



9. Select the DCOL item and reset to 1.
10. Press **MUTING** then **ENTER** to save into the memory.

## V. Size Adjustment (VSIZ)

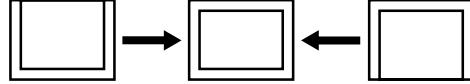
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VSIZ item with **1** and **4**.
4. Adjust value of VPOS with **3** and **6** for the best vertical center.
5. Press **MUTING** then **ENTER** to save into the memory.



## V. Center Adjustment (VPOS)

Perform this adjustment after performing H. Frequency (Free Run) Check.

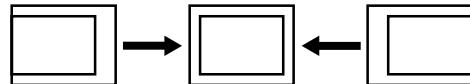
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the VPOS item with **1** and **4**.
4. Adjust value of VPOS with **3** and **6** for the best vertical center.
5. Press **MUTING** then **ENTER** to save into the memory.



## H. Center Adjustment (HPOS)

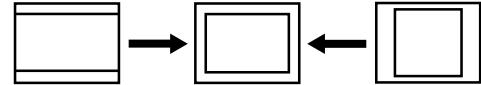
Perform this adjustment after performing H. Frequency (Free Run) Check.

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select the HPOS item with **1** and **4**.
4. Adjust the value of HPOS with **3** and **6** for the best horizontal center.
5. Press **MUTING** then **ENTER** to save into the memory.



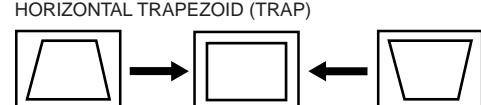
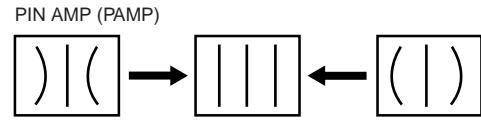
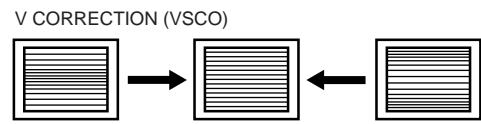
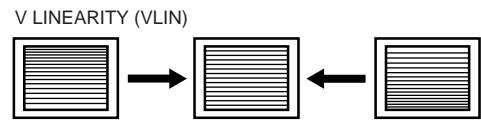
## H. Size Adjustment (HSIZ)

1. Input a monoscope signal.
2. Activate the Service Adjustment Mode.
3. Select HSIZ with **1** and **4**.
4. Adjust with **3** and **6** for the best horizontal size.
5. Press **MUTING** then **ENTER** to save into the memory.



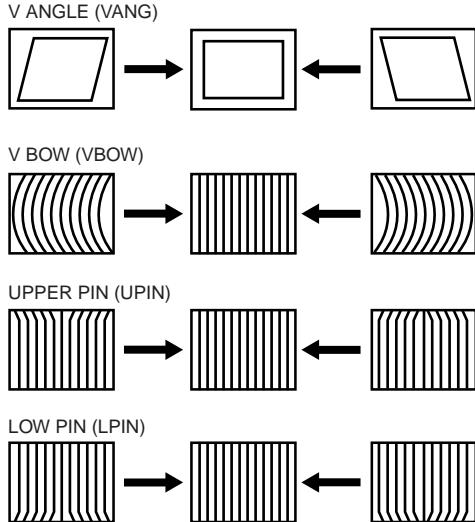
## V. Linearity (VLIN), V. Correction (VSCO), Pin Amp (PAMP), and Horizontal Trapezoid (TRAP) Adjustments

1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VLIN, VSCO, PAMP, and PPHA with **1** and **4**.
4. Adjust with **3** and **6** for the best horizontal size.
5. Press **MUTING** then **ENTER** to save into the memory.



## V. Angle (VANG), V. Bow (VBOW), Upper pin (UPIN) and Low Pin (LPIN) Adjustments

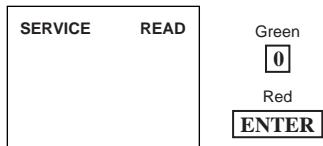
1. Input a crosshatch signal.
2. Activate the Service Adjustment Mode.
3. Select VANG, VBOW, UPIN, and LPIN with **[1]** and **[4]**.
4. Adjust with **[3]** and **[6]** for the best picture.
5. Press **[MUTING]** then **[ENTER]** to save into the memory.



## Service Adjustment Mode Memory

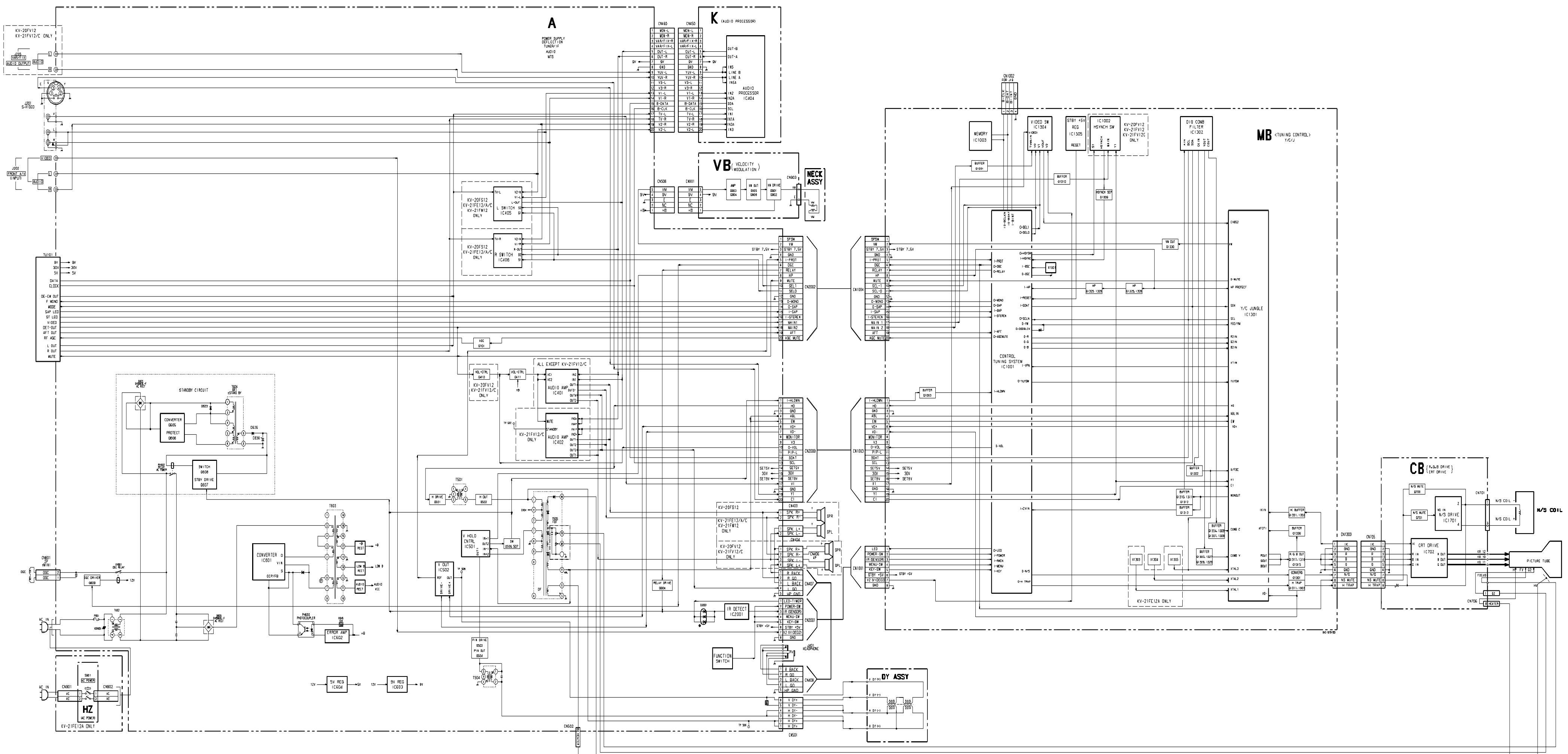
1. Change the value of the DCOL item to “1”.
2. After completing all adjustments, press **[0]** then **[ENTER]**.

Read From Memory

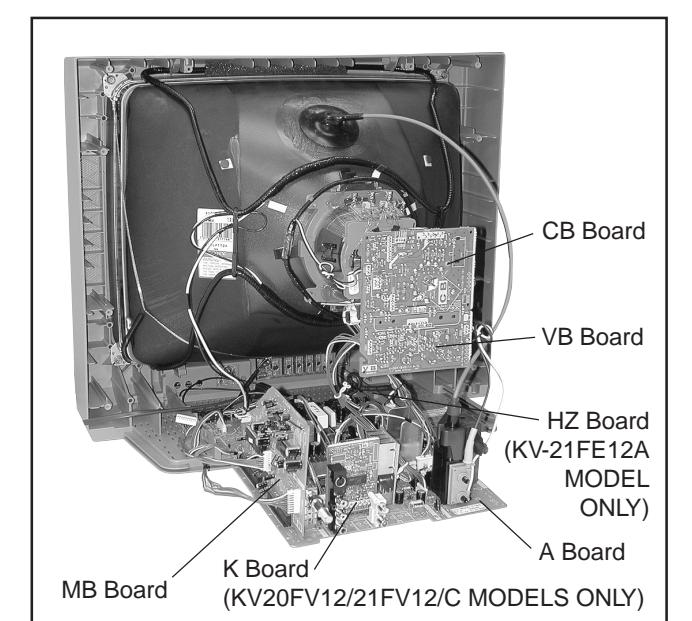


SECTION 6  
DIAGRAMS

## 6.1 BLOCK DIAGRAM



## 6.2 CIRCUIT BOARD LOCATIONS



Part Replaced (█)	Adjustment (●)
DY, T568, CRT, IC-301, IC601, C507, C520, C505, C509, C515, T504, L508, C541, D517, D518, D519, R560, R561, R562, R563, R565, R566, R567, R525.....A Board	HV HOLD-DOWN (R562)

IC601, PH601.....A Board B+ VOLTAGE CONFIRMATION

- All voltages are in Volts
- Voltage is DC with respect to ground unless otherwise noted.
- Readings are taken with a 10MΩ digital multimeter.
- Readings are taken with a color-bar signal input.
- Voltage variations may be noted due to normal production tolerance.
- Circled numbers are waveform references.
- \* : cannot be measured
- : B+ Line
- : B- Line
- : Signal path

## Reference Information

RESISTOR	: RN	METAL FILM
	: RC	SOLID
	: FPRD	NON FLAMMABLE CARBON
	: FUSE	NON FLAMMABLE FUSIBLE
	: RW	NON FLAMMABLE WIREWOUND
	: RS	NON FLAMMABLE METAL OXIDE
	: RB	NON FLAMMABLE CEMENT
	: □	ADJUSTMENT RESISTOR
COIL	: LF-8L	MICRO INDUCTOR
CAPACITOR	: TA	TANTALUM
	: PS	STYROL
	: PP	POLY/PROPYLENE
	: PT	MYLAR
	: MPS	METALIZED POLYESTER
	: MPP	METALIZED POLYPROPYLENE
	: ALB	BIPOLAR
	: ALT	HIGH TEMPERATURE
	: ALR	HIGH RIPPLE

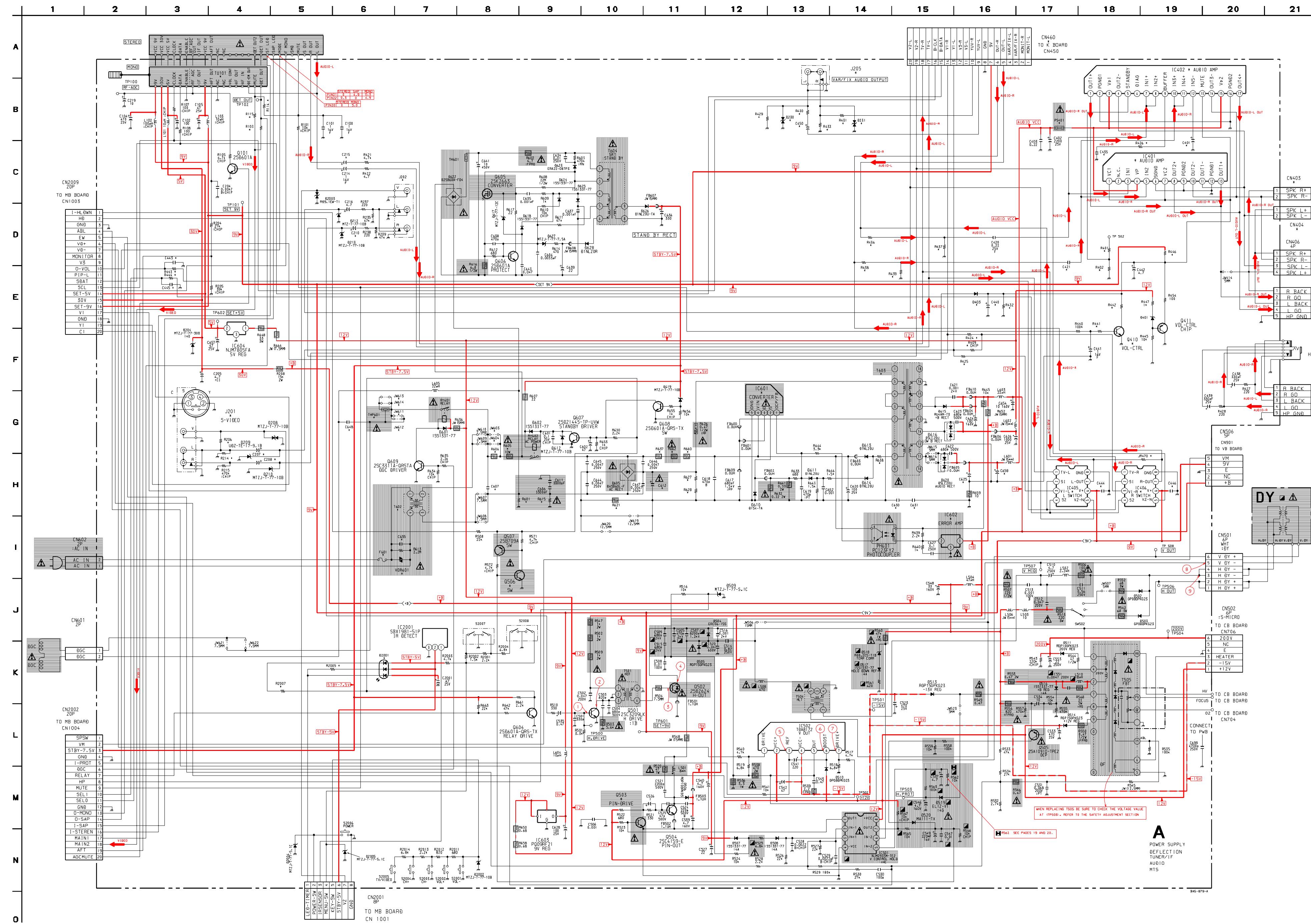
## Note:

The components identified by shading and △ mark are critical for safety. Replace only with the part number specified.

The symbol (█) (displayed on component side of the circuit board) indicates fast operating fuse. Replace only with fuse of the same rating as marked.

Les composants identifiés par un trame et une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié. Le symbole (█) indique une fusible à action rapide. Doit être remplacée par une fusible de même valeur, comme marqué.

## A BOARD SCHEMATIC DIAGRAM



A Board →

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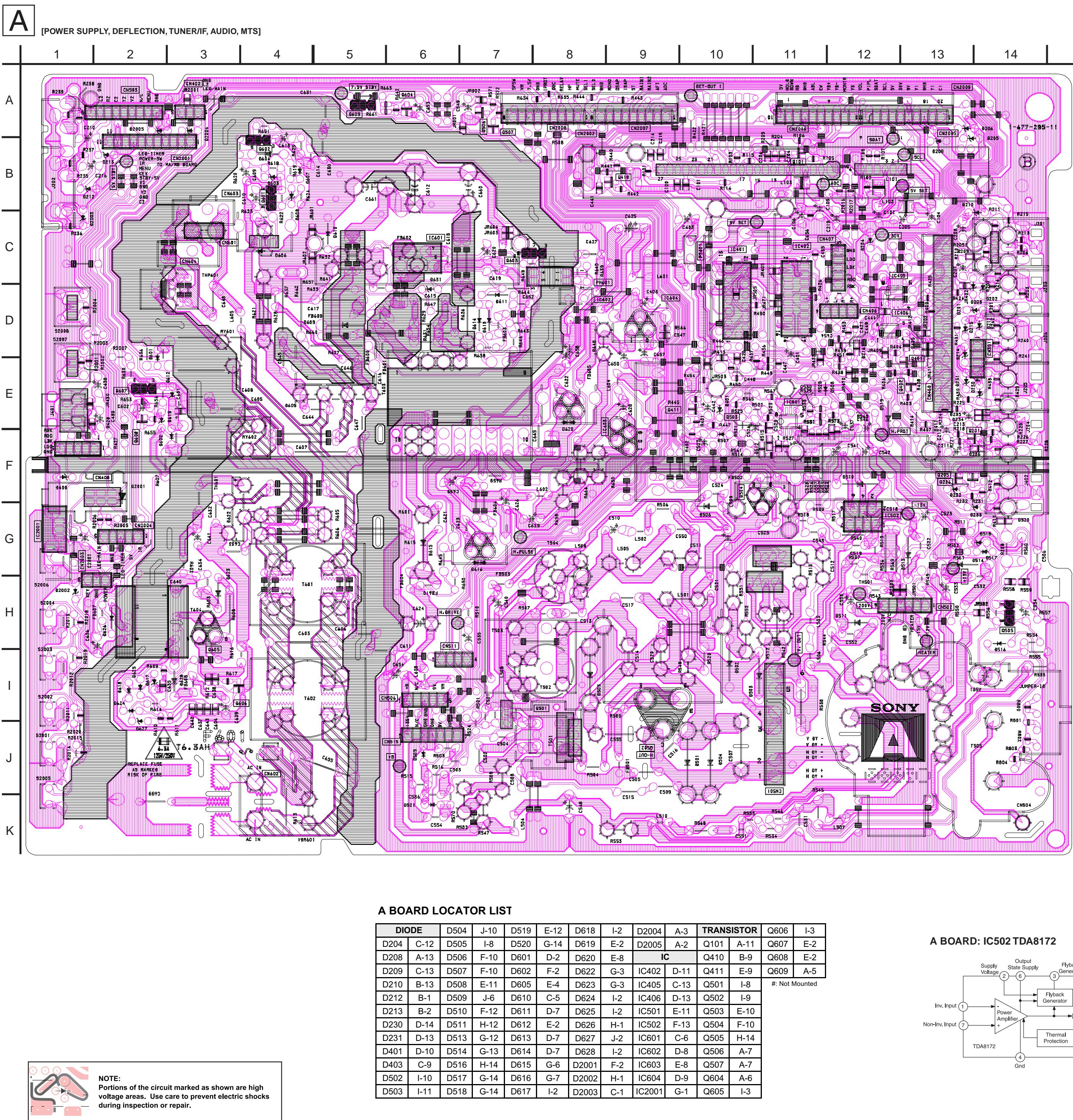
— 32 —

— 33 —

## A BOARD MARK (\*) LIST

REF NO.	LOC.	KV-20FS12	KV-21FE12 KV-21FE12C	KV-21FM12	KV-20FV12	KV-21FE12A	KV-21FV12 KV-21FV12C
C207	G-4	4.7µF	#	4.7µF	JW 5.0 MM	4.7µF	JW 5.0 MM
C208	G-4	4.7µF	4.7µF	4.7µF	JW 5.0 MM	4.7µF	JW 5.0 MM
C210	D-6	4.7µF	4.7µF	#	4.7µF	4.7µF	4.7µF
C215	C-6	1µF 16V	1µF 16V	#	1µF 16V	1µF 16V	1µF 16V
C401	C-19	#	#	#	#	#	100µF
C421	D-17	0.22µF 25V	0.22µF 25V	#	0.22µF 25V	0.22µF 25V	0.22µF 25V
C435	C-18	#	#	#	#	#	0.22µF 25V
C440	E-16	4.7µF	4.7µF	4.7µF	#	4.7µF	#
C443	D-3	0.001µF	0.001µF	0.001µF	#	0.001µF	#
C444	H-18	0.01µF	0.01µF	0.01µF	#	0.01µF	#
C445	E-3	0.001µF	0.001µF	0.001µF	#	0.001µF	#
C446	H-19	0.01µF	0.01µF	#	#	0.01µF	#
C450	B-13	#	#	#	0.47µF 16V	#	.47µF 16V
C607	H-8	0.47µF 125V	0.47µF 300V	0.47µF 300V	0.47µF 125V	0.47µF 300V	0.47µF 300V
C612	H-11	470µF 250V	330µF 400V	330µF 400 V	470µF 250 V	330µF 400V	330µF 400V
C625	H-16	15000µF 25V	1000µF 25V	1000µF 25V	1000µF 25V	1000µF 25V	1000µF 25V
C630	H-15	.0047µF 250V	#	#	.0047µF 250V	#	#
C631	H-15	.0047µF 250V	#	#	.0047µF 250V	#	#
C648	G-6	0.22 µF 125V	0.22µF 300V	0.22µF 300V	0.22µF 125V	0.22µF 300V	0.22µF 300V
C655	H-6	0.47µF 125V	0.47µF 300V	0.47µF 300V	0.47µF 125V	0.47µF 300V	0.47µF 300V
C658	H-16	1000µF 25V	1000µF 25V	1000µF 25V	1000µF 25V	1000µF 25V	15000µF 25V
CN403	C-21	1-564-505-11	1-564-505-11	1-564-505-11	#	1-564-505-11	#
CN404	C-21	1-564-505-11	1-564-505-11	1-564-505-11	#	1-564-505-11	#
CN460	A-15	#	#	#	1-573-298-21	#	1-573-298-21
D230	B-13	#	#	#	RD9.1EW-T1	#	RD9.1EW-T1
D231	B-14	#	#	#	RD9.1EW-T1	#	RD9.1EW-T1
D403	E-16	MA111-TX	MA111-TX	MA111-TX	#	MA111-TX	#
D2001	K-6	LNK0120022G	LNK0120022G	LNK0120022G	LNK0120022G1	LNK022022G2	LNK01220022G1
F601	I-6	6.3A/125V	6.3A/250V	6.3A/250V	6.3A/125V	6.3A/250V	6.3A/250V
IC401	C-18	TDA7075AQ/N2	TDA7075AQ/N2	TDA7075AQ/N2	TDA7075AQ/N2	TDA7075AQ/N2	#
IC402	A-19	#	#	#	#	#	TDA8580Q/N1
IC405	H-17	NJM2521M-TE1	NJM2521M-TE1	NJM2521M-TE1	#	NJM2521M-TE1	#
IC406	H-18	NJM2521M-TE1	NJM2521M-TE1	#	#	NJM2521M-TE1	#
IC601	F-12	STR-F6624	STR-F6654	STR-F6654	STR-F6624	STR-F6654	STR-F6654
J201	G-4	1-794-118-11	1-794-118-11	1-794-115-11	1-794-119-11	1-794-118-11	1-794-119-11
J202	C-7	1-794-267-11	1-794-267-11	1-794-266-21	1-794-267-11	1-794-267-11	1-794-267-11
J205	A-14	#	#	#	1-794-116-11	#	1-794-116-11
JR470	J-18	#	#	0	#	#	#
PS401	B-17	1-576-336-21	1-576-336-21	1-576-336-21	1-576-336-21	1-576-336-21	1-532-686-21
Q410	F-18	#	#	#	2SDA601A-QRS-TX	#	2SDA601A-QRS-TX
Q503	M-11	8-729-422-27	8-729-422-27	8-729-120-28	8-729-422-27	8-729-422-27	8-729-422-27
Q506	J-9	8-729-422-27	8-729-120-28	8-729-120-28	8-729-120-28	8-729-120-28	8-729-120-28
R103	B-4	#	#	0	#	#	#
R114	B-4	#	#	0	#	#	#
R115	B-4	0	0	#	0	0	0
R206	G-4	#	#	0	#	#	#
R214	G-4	470K	470K	#	470K	470K	470K
R401	D-18	#	#	#	#	#	20K
R402	D-18	#	#	#	#	#	10K
R409	F-16	#	#	4.7K	#	#	#
R424	F-16	4.7K	4.7K	4.7K	#	4.7K	#
R425	F-16	4.7K	4.7K	0	#	4.7K	#
R426	C-18	#	#	#	#	#	22
R429	B-13	#	#	#	470K	#	470K
R430	B-13	#	#	#	1K	#	1K
R431	B-14	#	#	#	1K	#	1K
R432	E-16	10K	10K	10K	33K	10K	33K
R433	B-13	#	#	#	470K	#	470K
R436	D-14	4.7K	4.7K	4.7K	10K	4.7K	10K
R437	E-15	4.7K	4.7K	4.7K	10K	4.7K	10K
R438	E-14	4.7K	4.7K	#	10K	4.7K	10K
R439	E-15	4.7K	47K	47K	10K	4.7K	10K
R441	E-18	#	#	#	#	#	22K
R442	E-18	#	#	#	#	#	100
R443	E-3	220	220	220	#	220	#
R444	E-3	220	220	220	#	220	#
R446	D-19	#	#	#	33K	#	33K
R601	H-9	4.7M 1/2W	#	#	4.7M 1/2W	#	#
R605	H-8	1 10W	1.2 10W	1.2 10W	1 10W	1.2 10W	1.2 10W
R606	G-8	1 10W	1.2 10W	1.2 10W	1 10W	1.2 10W	1.2 10W
R615	H-9	#	8.2M	8.2M	#	8.2M	8.2M
R621	H-10	#	1.2 10W	1.2 10W	#	1.2 10W	1.2 10W
R627	H-11	390K	270K	270K	390K	270K	270K
R628	H-11	JW 5.0 MM	270K	270K	JW 5.0 MM	270K	270K
R637	H-11	JW 20.0 MM	5.6K	5.6K	JW 20.0 MM	5.6K	5.6K
R638	H-14	33	56	56	33	56	56
R660	H-11	15K 3W	5.6K 3W	5.6K 3W	15K 3W	5.6K 3W	5.6K 3W
R662	H-11	JW 20.0 MM	5.6K	5.6K	JW 20.0 MM	5.6K	5.6K
R2005	K-5	0	0	0	#	0	0
R2007	K-5	#	#	#	#	470	#
T602	H-6	1-431-419-11	1-426-717-11	1-426-717-11	1-431-419-11	1-426-717-11	1-426-717-11
T603	F-15	1-433-806-11	1-433-807-11	1-433-807-11	1-433-806-11	1-433-807-11	1-433-807-11
THP601	G-6	1-809-539-11	1-803-540-11	1-803-540-11	1-809-539-11	1-803-540-11	1-803-540-11
TU101	A-3	8-598-431-30	8-598-431-30	8-598-501-00	8-598-431-30	8-598-542-00	8-598-542-00
VDR601	I-6	1-803-585-11	1-803-967-11	1-803-967-11	1-803-585-11	1-803-967-11	1-803-967-11

#: Not Mounted



**A BOARD IC VOLTAGE LIST**

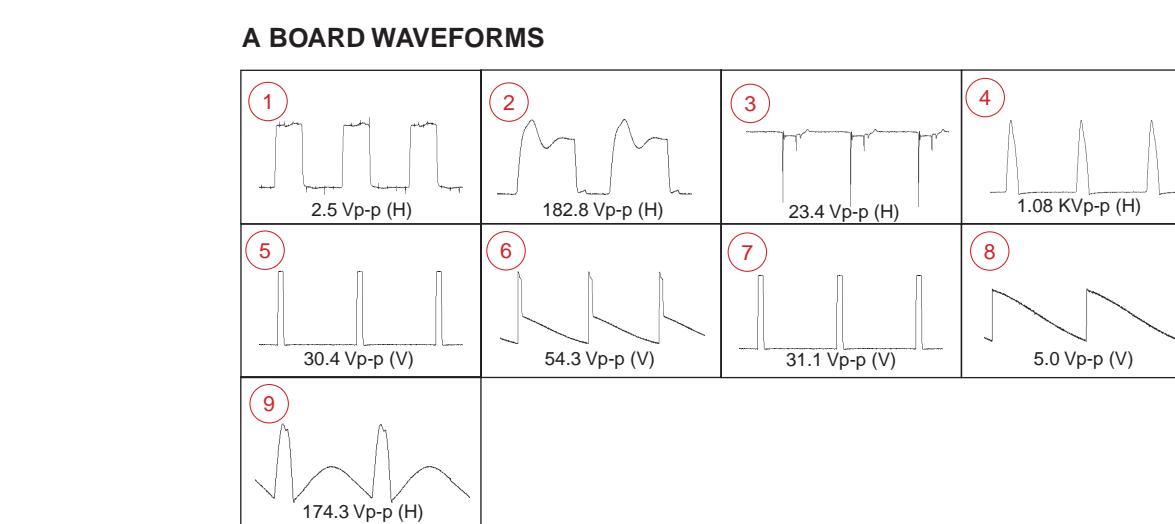
IC401	2	GND	IC406	7	2.1	4	13.3
pin	volt		pin	volt	pin	volt	
1	0.6	4	6.8	1	6.0	1	0.2
2	0.0	5	4.3	2	0.1	2	3.7
3	2.4	6	NC	3	6.1	3	-2.6
4	14.3	7	4.1	4	0.1	4	GND
5	2.4	8	4.1	5	6.1	5	9.5
6	0.0	9	6.8	6	9.0	6	10.1
7	0.6	10	4.1	7	5.3	7	0.1
8	6.9	pin	volt	8	GND	8	14.0
9	0.0	1	6.0	10	4.1	pin	volt
10	6.9	2	0.1	11	6.2	2	123.4
11	6.9	3	6.1	12	0.2	1	2.1
12	0.0	4	0.1	13	6.2	2	14.0
13	6.9	5	6.1	14	9.1	3	-12.6
14	6.8	8	GND	15	5.4	4	-13.9
15	6.8	9	8	16	GND	5	0.2
16	6.8	10	8	17	6.2	6	8.9
17	6.8	11	8	18	135.9	3	GND

All voltages are in V

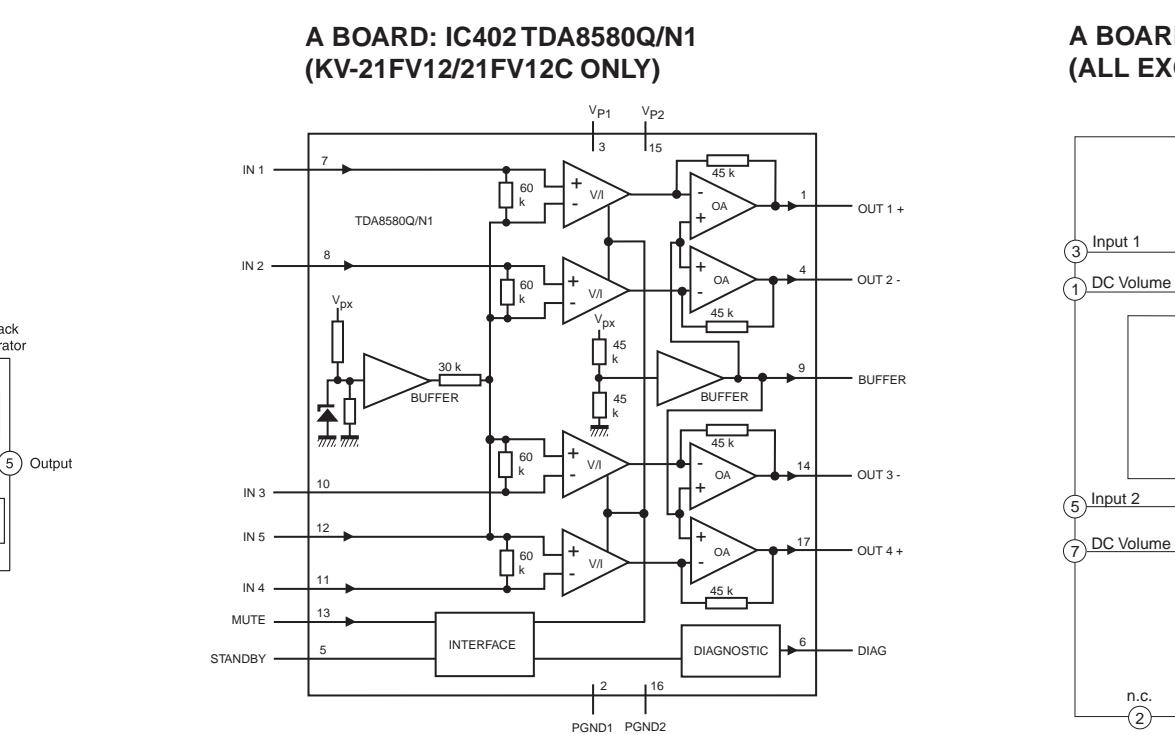
**A BOARD TRANSISTOR VOLTAGE LIST**

B	C	E	B	C	E	
Q101	0.0	5.6	0.0	Q506	0.0	0.0
Q410	0.0	5.2	0.0	Q507	0.0	0.0
Q411	5.3	0.0	5.2	Q604	0.1	4.1
Q501	0.0	93.3	-0.6	Q606	-36.1	-35.3
Q502	-0.1	13.3	0.0	Q607	0.7	0.1
Q503	0.2	3.8	0.0	Q608	0.0	0.7
Q504	0.1	-6.5	0.0	Q609	0.0	13.9
Q505	134.9	1.8	135.5			

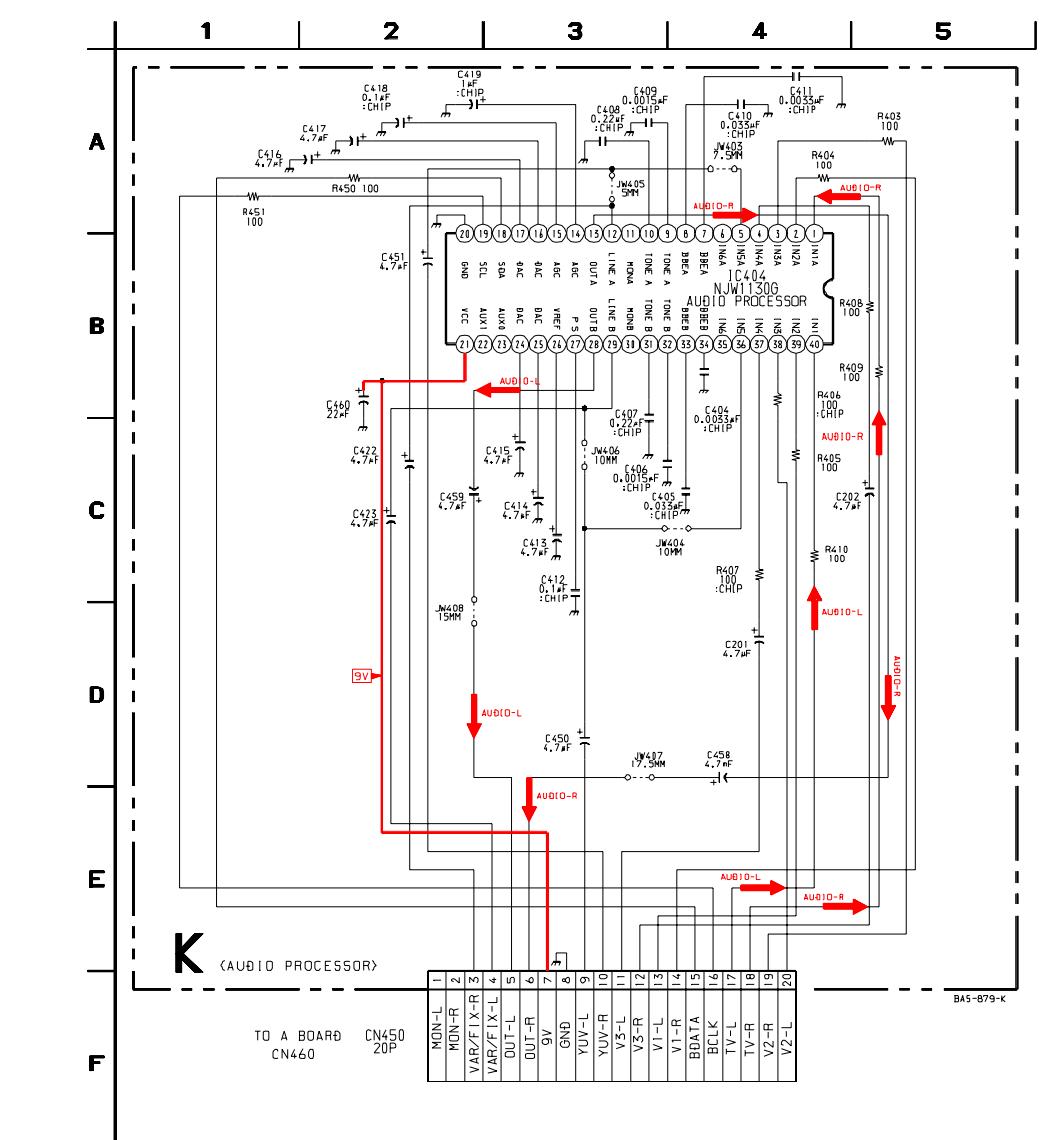
All voltages are in V



**A BOARD IC BLOCK DIAGRAMS**



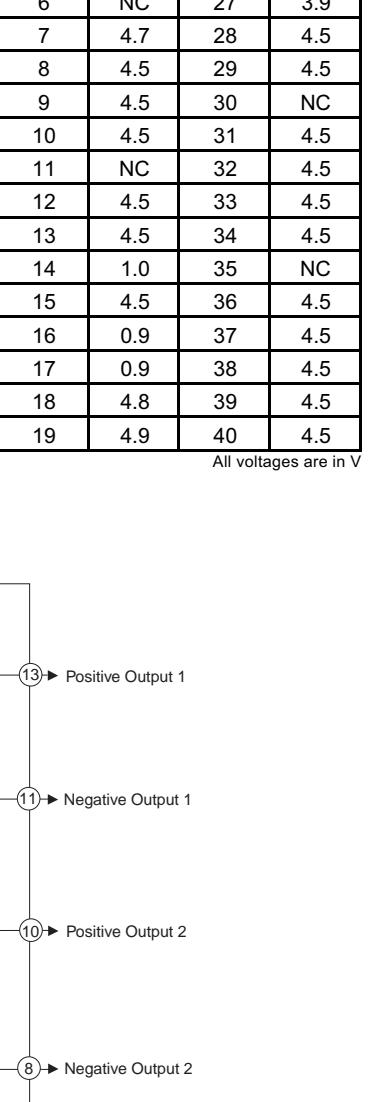
**K BOARD SCHEMATIC DIAGRAM (KV-20FV12/21FV12/21FV12C ONLY)**



**K BOARD IC VOLTAGES**

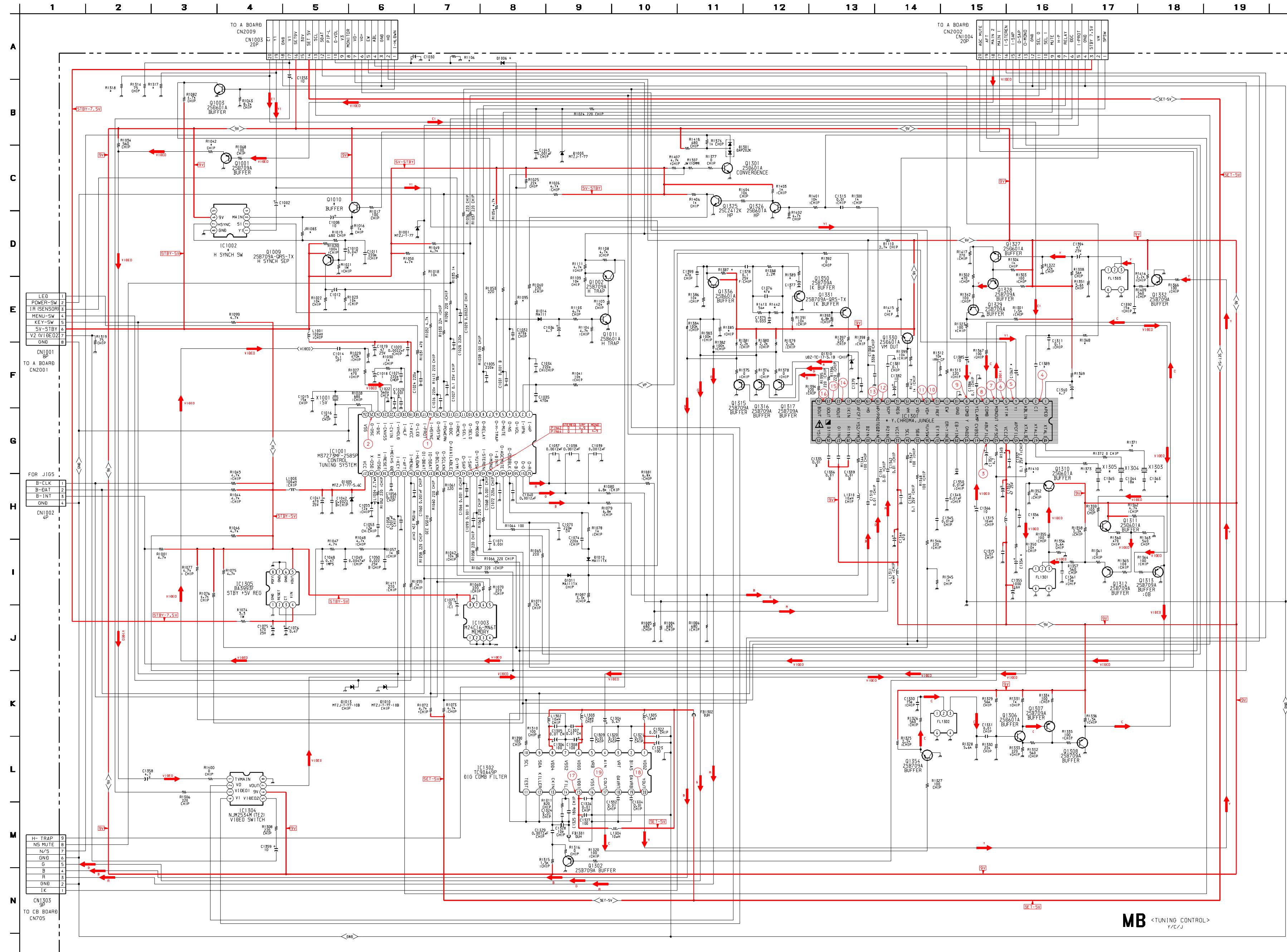
IC404	20	GND
pin	volt	
1	4.5	22
2	4.5	23
3	4.5	24
4	4.5	25
5	4.5	26
6	NC	27
7	4.7	28
8	4.5	29
9	4.5	30
10	4.5	31
11	NC	32
12	4.5	33
13	4.5	34
14	1.0	35
15	4.5	36
16	0.9	37
17	0.9	38
18	4.8	39
19	4.9	40

All voltages are in V



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MB BOARD SCHEMATIC DIAGRAM



← A &amp; K Boards MB Board →

MB BOARD MARK (\*) LIST

REF NO.	LOC.	KV-20FS12	KV-21FE12	KV-21FV12	KV-21FE12A	KV-21FM12
C1002	C-4	#	10μF	#	4.7μF	#
C1030	A-6	4.7μF	4.7μF	4.7μF	22μF	47μF
C1354	I-15	4.7μF	4.7μF	4.7μF	470PF	470PF
C1356	H-16	470PF	470PF	470PF	220PF	470PF
C1363	H-18	#	#	#	18PF	#
C1365	H-17	#	#	#	0.01μF	0.0047μF
C1367	F-15	#	10μF	#	0.01μF	0.01μF
C1379	F-13	0.01μF	0.01μF	0.0047μF	0.1μF	0.1μF
C1389	F-16	#	0.1μF	#	0.1μF	#
D1006	A-8	MA111-TX	MA111-TX	MA111-TX	MA111-TX	MA111-TX
J1002	D-4	#	NJM2534M(TE2)	#	CXA2131AS	CXA2135S
J1301	F-12	CXA2131AS	CXA2135S	CXA2131AS	0	0
JR1083	D-5	0	#	#	#	#
Q1010	C-6	2SC2412K-T-146-QRS	2SD601A-QRS-TX	2SD601A-QRS-TX	2SD601A-QRS-TX	2SD601A-QRS-TX
R1042	C-3	470	470	470	560	560
R1095	E-8	3.3K	#	#	3.3K	3.3K
R1106	A-7	33K	#	#	33K	33K
R1317	B-3	#	75	#	#	#
R1318	B-2	#	75	#	#	#
R1349	G-15	#	0	#	0	#
R1368	E-17	2.2K	#	#	2.2K	2.2K
R1369	F-17	#	#	#	4.7M	#
R1371	G-18	#	#	#	0	#
R1373	H-16	#	#	#	0	#
R1385	E-11	470K	470K	470K	470K	470K
R1397	D-11	82K	82K	82K	33K	6.2K
R1399	D-12	8.2K	8.2K	8.2K	15K	8.2K
R1410	G-16	0	0	0	0	0
R1443	E-12	180K	180K	180K	270K	180K
X1303	H-18	#	#	#	1-57-973-11	#
X1305	H-17	#	#	#	1-57-972-11	#

# Not Mounted

MB BOARD TRANSISTOR VOLTAGE LIST

Q1001		Q1011		Q1308		Q1315		Q1327		Q1332	
pin	volt										
B	4.8	B	0.0	B	5.7	B	1.4	B	2.4		
E	5.4	E	0.0	E	6.3	E	2.0	E	1.8	E	3.0
C	0.0	C	3.5	C	0.0	C	0.0	C	7.6	C	0.0
Q1002		Q1301		Q1310		Q1316		Q1328		Q1336	
pin	volt										
B	3.5	B	0.4	B	2.4	B	1.6	B	7.6	B	2.0
E	3.5	E	0.0	E	1.8	E	2.2	E	8.3	E	1.7
C	3.5	C	2.3	C	8.7	C	0.0	C	4.5	C	8.9
Q1003		Q1302		Q1311		Q1317		Q1329		Q1350	
pin	volt										
B	0.0	B	4.6	B	0.0	B	1.5	B	4.5	B	2.0
E	0.0	E	5.2	E	3.7	E	2.2	E	5.1	E	1.7
C	5.0	C	0.0	C	8.9	C	0.0	C	0.0	C	8.9
Q1009		Q1306		Q1312		Q1325		Q1330		Q1354	
pin	volt										
B	5.2	B	2.4	B	2.0	B	0.6	B	4.9	B	0.0
E	5.0	E	1.8	E	0.0	E	0.0	E	4.3	E	3.2
C	0.8	C	7.5	C	0.0	C	0.7	C	8.9	C	0.0
Q1010		Q1307		Q1313		Q1326		Q1331		Q1337	
pin	volt										
B	4.5	B	0.0	B	4.3	B	0.0	B	3.6		
E	3.8	E	8.2	E	5.0	E	0.0	E	3.6		
C	8.7	C	5.7	C	0.0	C	3.8	C	1.6		

All voltages are in V

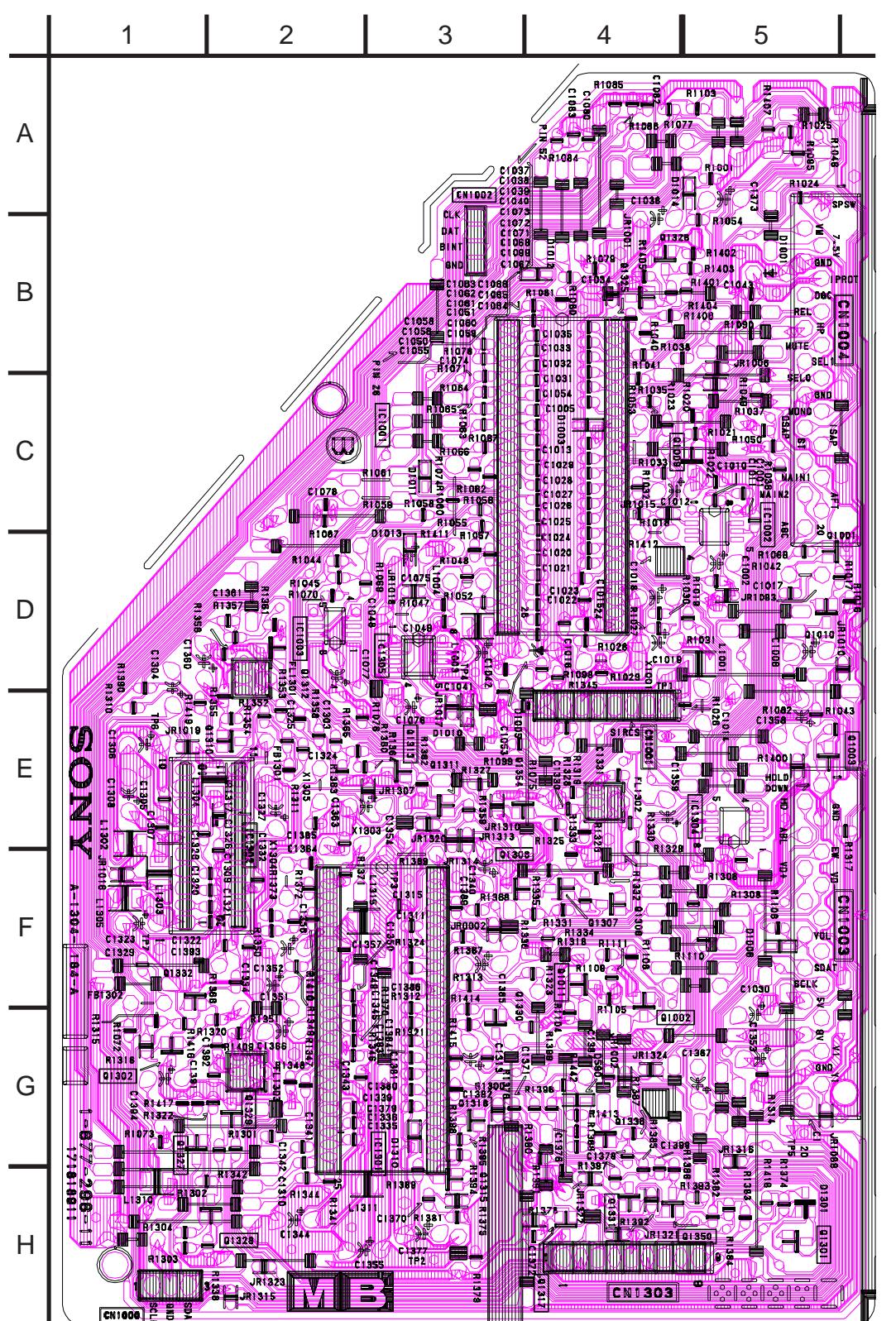
**MB BOARD IC VOLTAGE LIST**

IC1001	36	4.8	IC1301	36	0.2	IC1304	
pin	volt		pin	volt		pin	volt
1	1.7	38	4.8	1	3.3	38	5.3
2	4.8	39	4.8	2	5.1	39	5.5
3	0.0	40	NC	3	1.3	40	GND
4	0.4	41	0.0	4	5.1	41	5.1
5	0.0	42	0.1	5	4.8	42	6.2
6	0.1	43	5.0	6	4.3	43	5.1
7	NC	44	0.1	7	6.3	44	8.7
8	0.0	45	5.0	8	5.0	45	5.2
9	0.0	46	0.0	9	5.1	46	4.6
10	0.1	47	5.0	10	GND	47	1.7
11	0.1	48	0.0	11	4.1	48	0.2
12	5.0	49	0.0	12	2.4	IC1302	2
13	0.0	50	0.0	13	3.5	pin	volt
14	4.3	51	0.0	14	3.5	1	5.0
15	4.9	52	0.0	15	5.4	2	1.4
16	0.0	IC1002	16	7.7	3	3.2	6
17	-0.2	pin	volt	17	1.6	4	2.4
18	4.9	1	4.6	18	3.5	5	1.9
19	5.0	2	4.8	19	2.3	6	5.0
20	2.1	3	4.6	20	2.6	7	0.0
21	0.2	4	NC	21	1.5	8	5.0
22	2.3	5	NC	22	1.5	9	4.9
23	GND	6	8.9	23	1.6	10	4.9
24	2.2	7	3.8	24	1.4	11	0.0
25	2.3	8	GND	25	NC	12	0.0
26	0.0	IC1003	26	4.6	13	2.5	
27	4.9	pin	volt	27	4.6	14	2.1
28	2.2	1	GND	28	4.6	15	5.0
29	2.3	2	GND	29	0.0	16	0.0
30	5.0	3	GND	30	4.5	17	2.5
31	0.0	4	GND	31	4.5	18	3.2
32	5.0	5	4.8	32	4.5	19	1.9
33	2.4	6	4.8	33	8.7	20	2.4
34	4.4	7	GND	34	4.9		
35	5.0	8	5.0	35	4.8		

All voltages are in V

**MB**

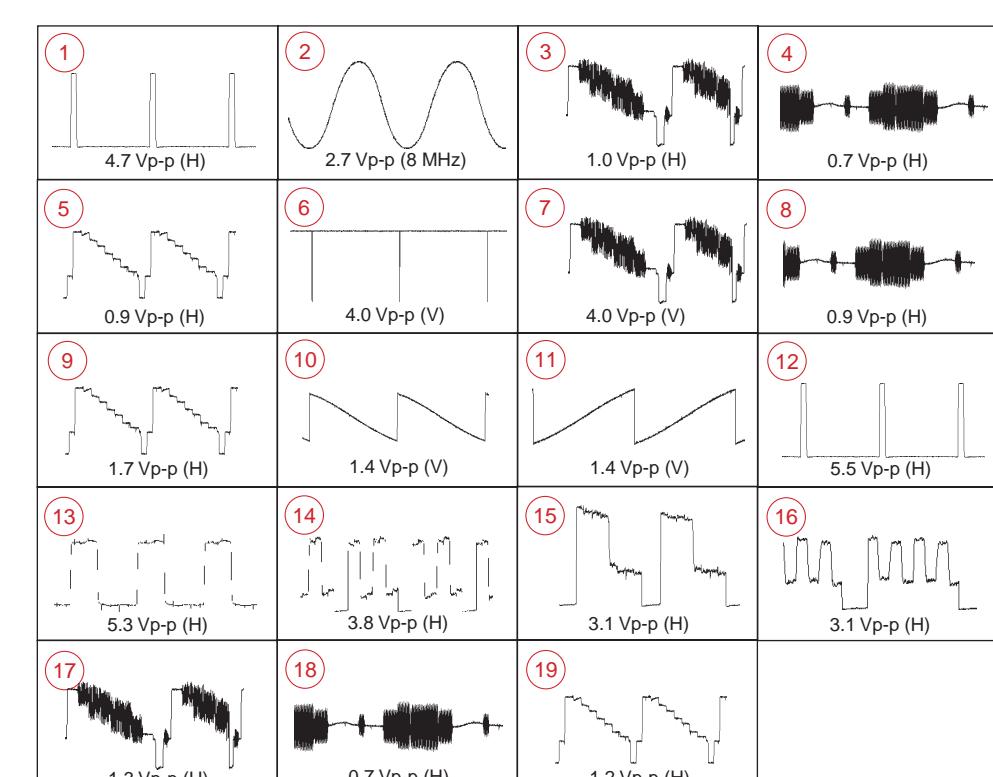
[TUNING CONTROL, YCJ]



**MB BOARD LOCATOR LIST**

DIODE	D1013	C-2	IC1003	D-2	Q1002	G-4	Q1306	F-4	Q1315	H-3	Q1329	G-2	CRYSTAL	
D1001	B-5	D1014	A-4	IC1301	G-2	Q1003	E-5	Q1307	F-4	Q1316	G-3	Q1330	G-3	X1001 D-4
D1003	C-3	D1301	H-5	IC1302	E-2	Q1009	G-2	Q1308	F-3	Q1317	H-3	Q1331	H-4	X1303 E-2
D1005	E-3	D1310	G-3	IC1304	E-4	Q1010	D-5	Q1310	E-1	Q1325	B-4	Q1332	F-1	X1304 E-2
D1010	E-2	IC	IC1305	D-2	Q1011	F-3	Q1311	E-3	Q1326	B-4	Q1336	G-4	X1305 E-2	
D1011	C-3	IC1001	C-2	TRANSISTOR	H-5	Q1312	D-2	Q1327	G-1	Q1350	H-4			# Not Mounted
D1012	B-3	IC1002	C-5	Q1001	D-5	Q1302	G-1	Q1313	E-3	Q1328	H-2	Q1354	E-3	

**MB BOARD WAVEFORMS**

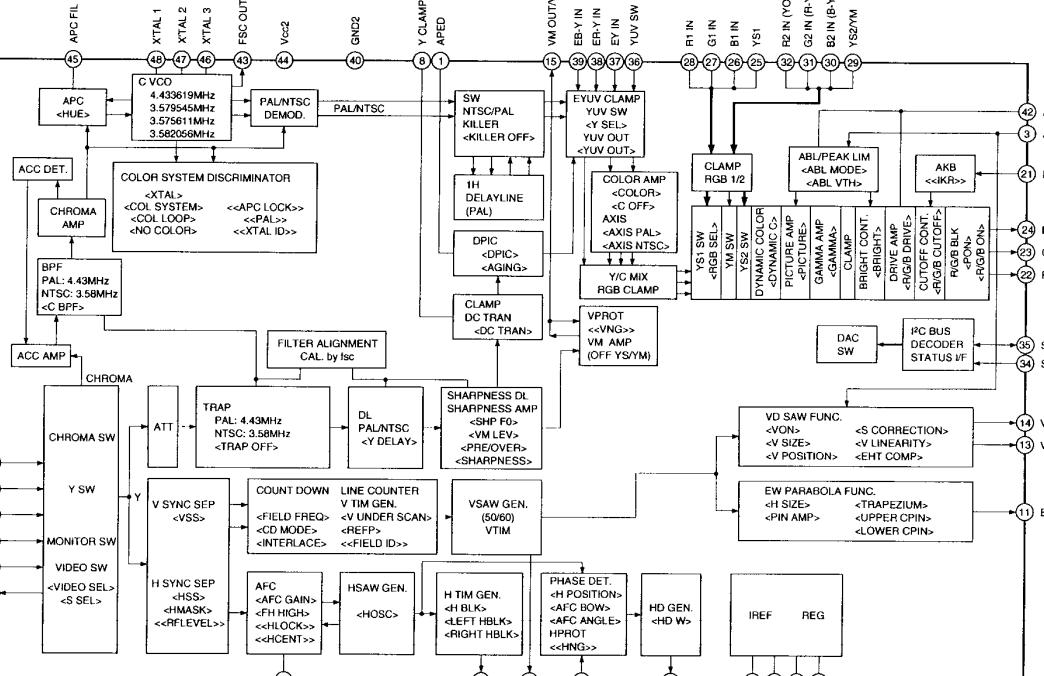


**NOTE:**  
Portions of the circuit marked as shown are high voltage areas. Use care to prevent electric shocks during inspection or repair.

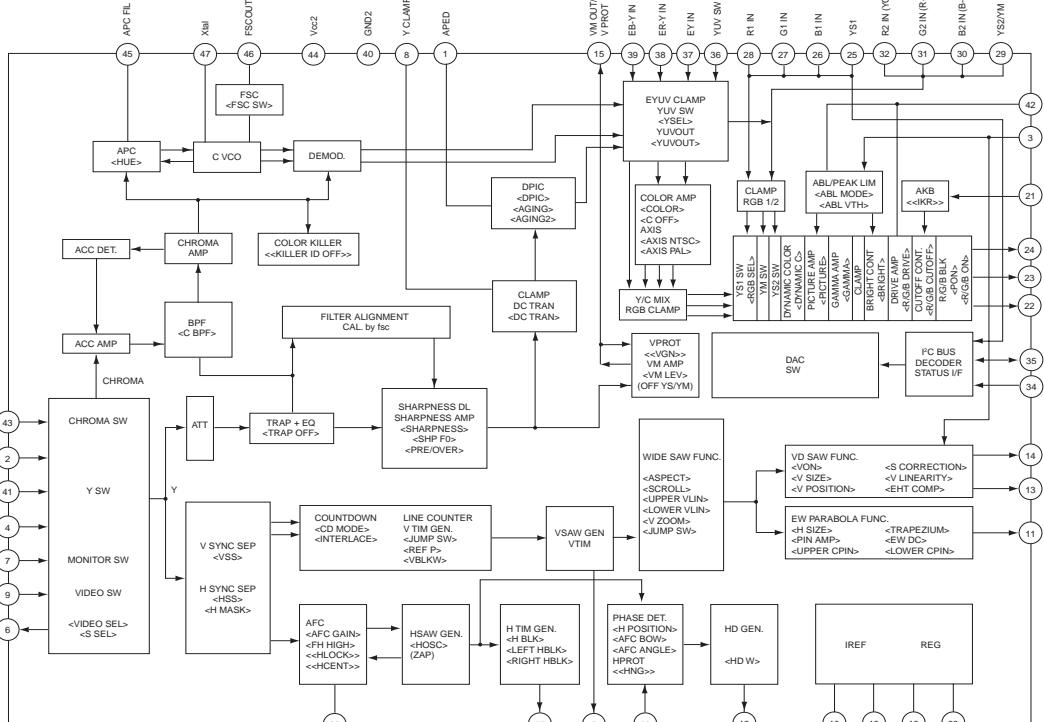
KV-20FS12/20FV12/21FE12/A/C/21FM12/21FV12/C

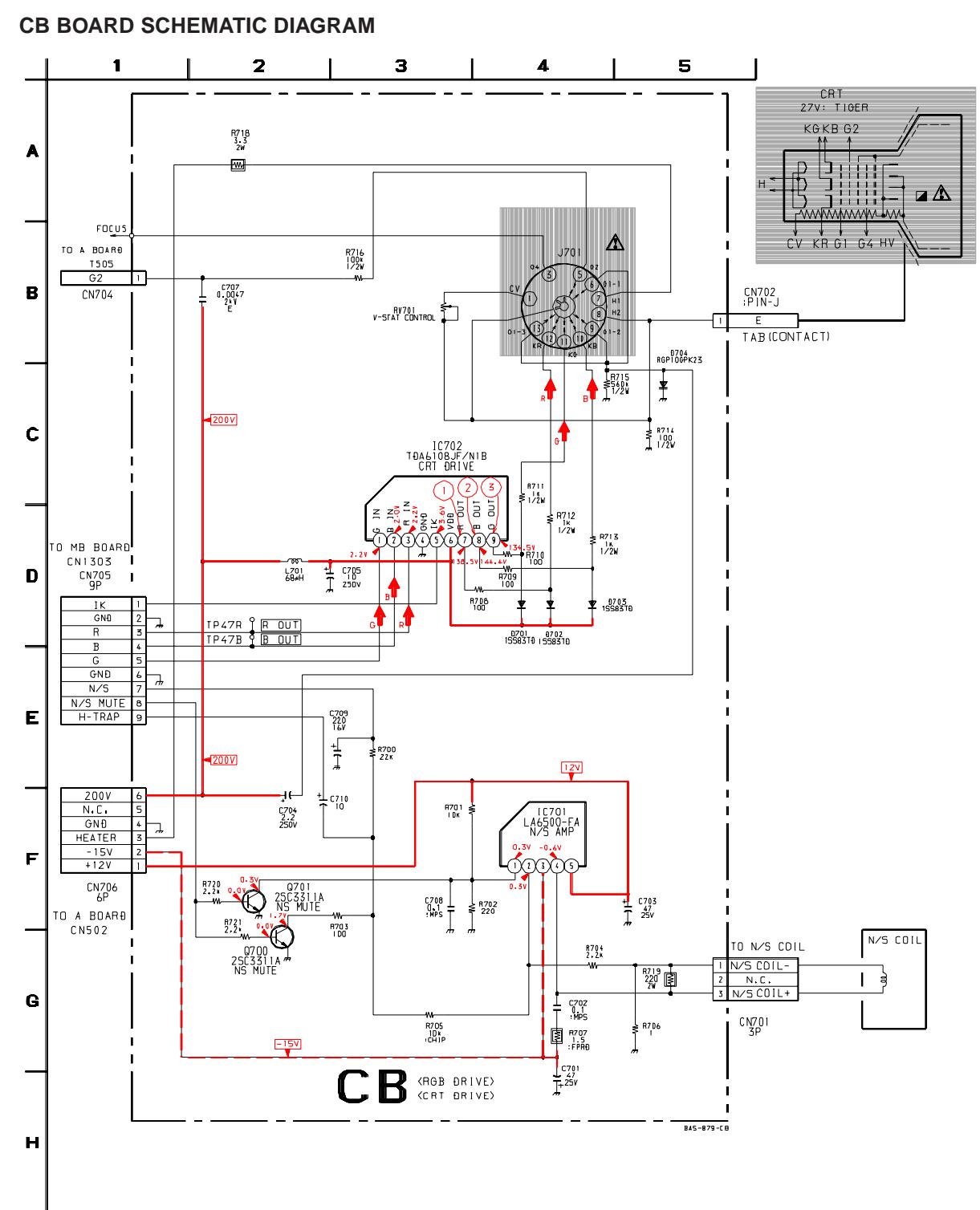
**MB BOARD IC BLOCK DIAGRAMS**

**MB BOARD: IC1301 CXA2135 (KV-21FE12A ONLY)**

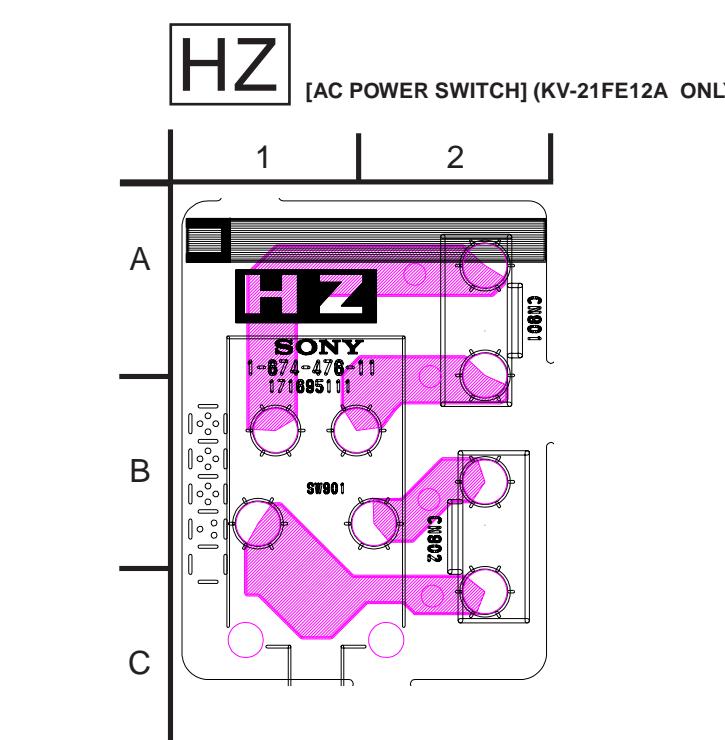
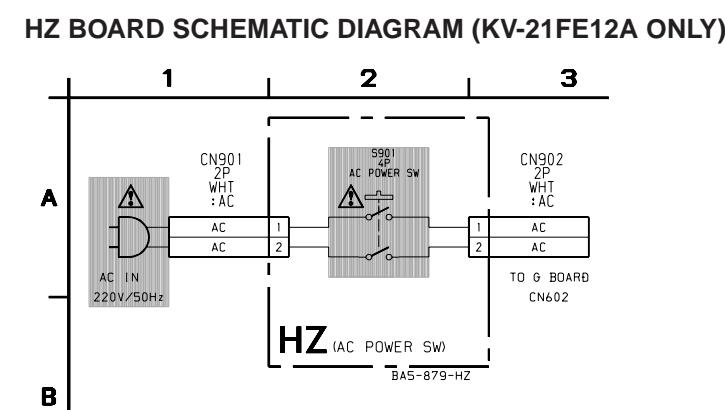
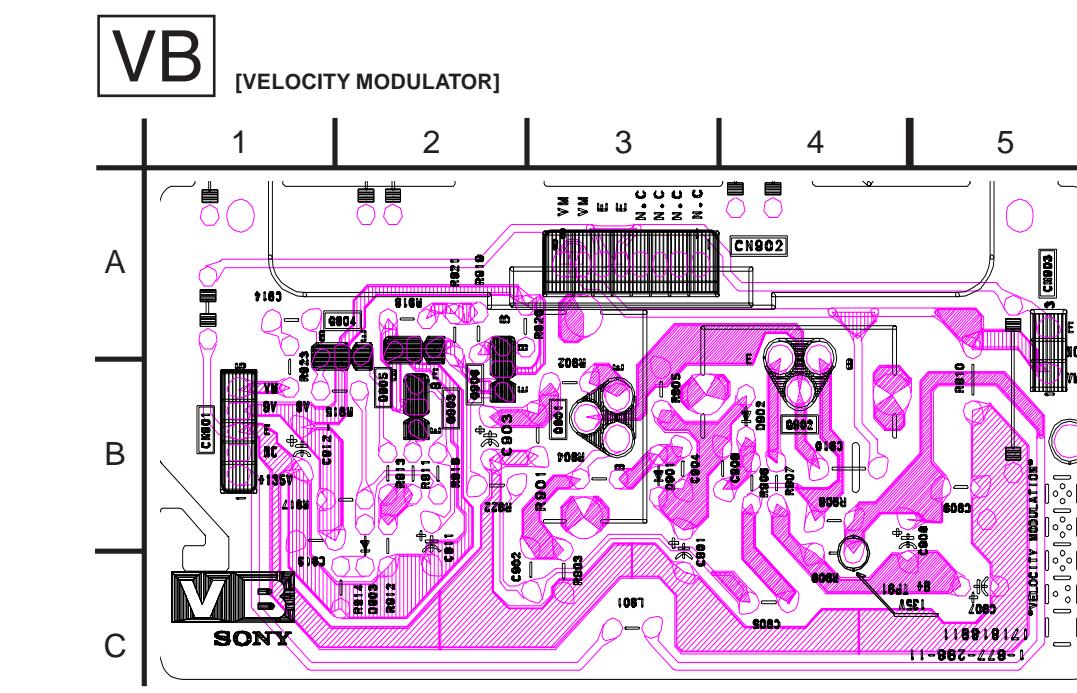
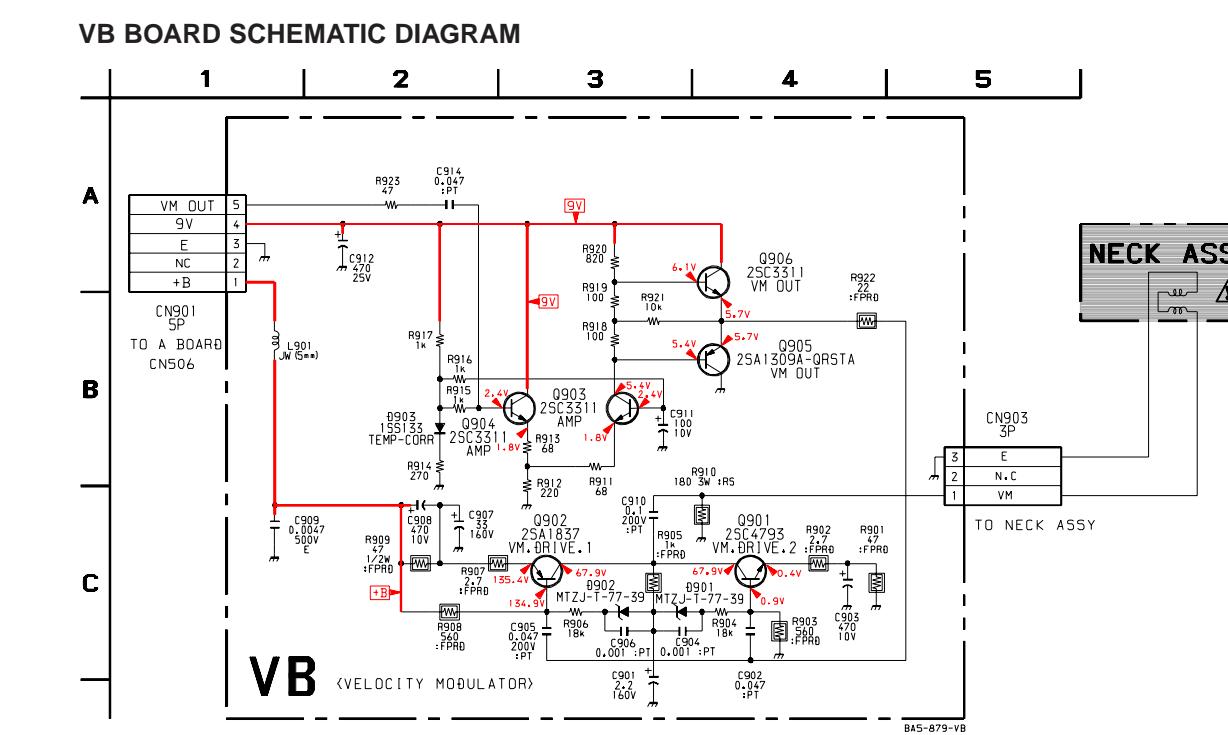
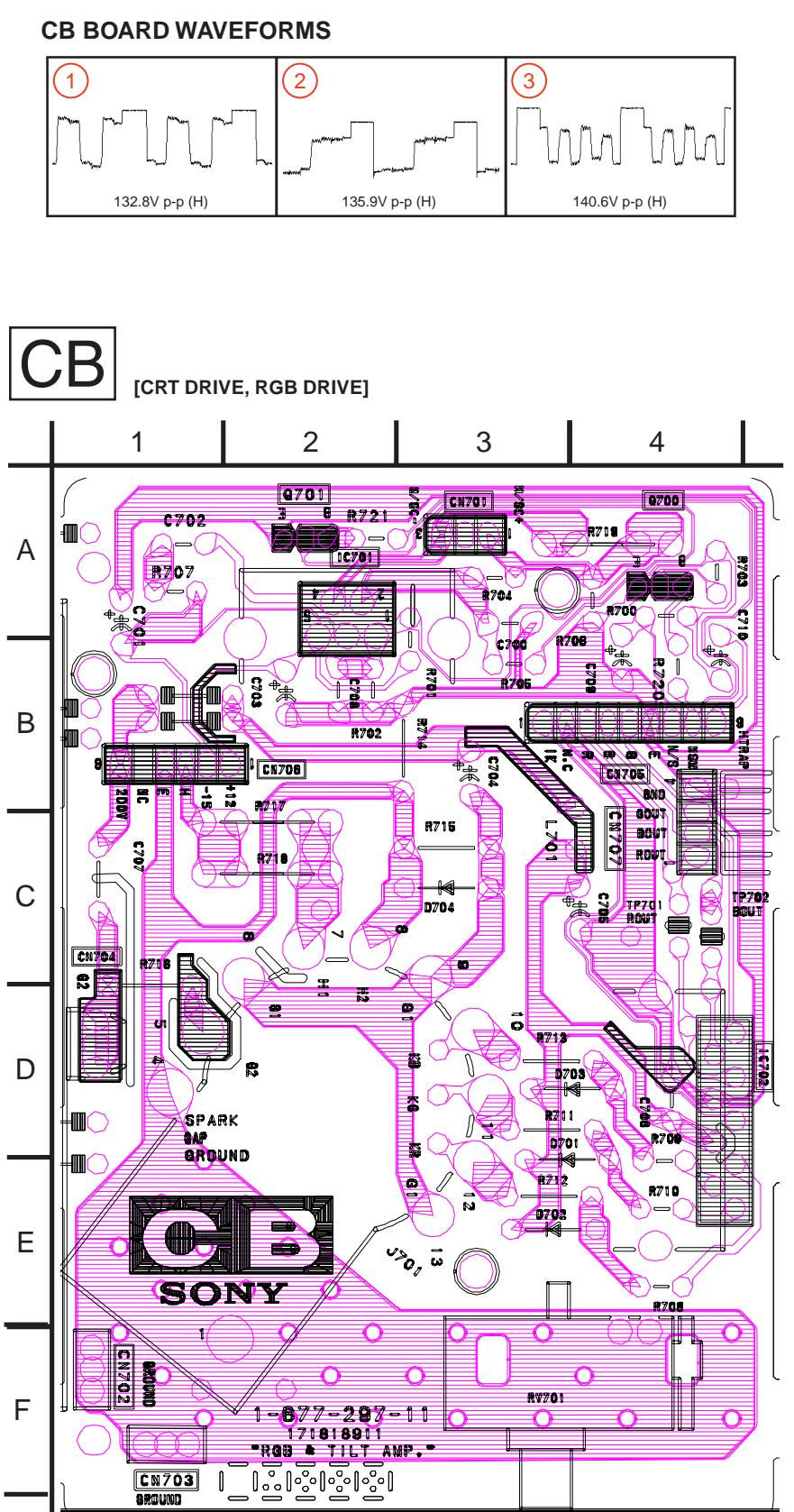


**MB BOARD: IC1301 CXA2131AS**





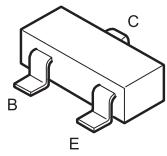
← MB Board CB VB & HZ Boards →



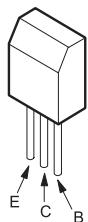
**NOTE:**  
Portions of the circuit marked as shown are high voltage areas. Use care to prevent electric shocks during inspection or repair.

## 6-4. SEMICONDUCTORS

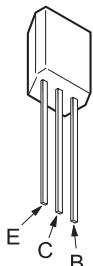
2SB709A-QRS-TX  
2SD601A-QRS-TX  
2SC2412K-T-146-QR



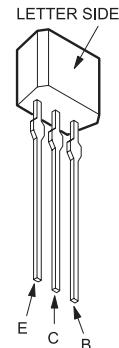
2SC3209LK-TP



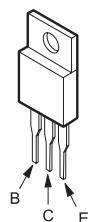
2SC331740S-QRT



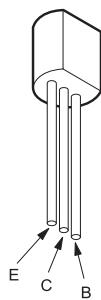
2SA1309A-QRT  
2SC3311A-QRSTA  
2SD2144S-TP-UVW



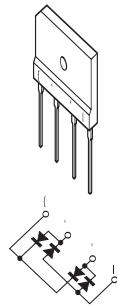
2SA1837  
2SC4159-E



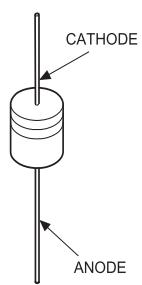
2SA1091O-TPE2  
2SA993AS-QRT



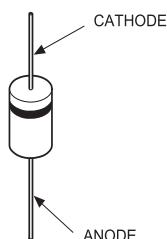
2SK2845-LB102



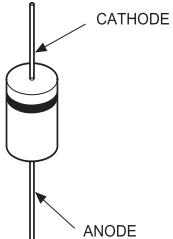
1SS133T-77  
D1N2OR-TA  
D1NS4-TA  
MTZJ-T-7712C  
MTZJ-T-77-39  
RD8.2ES-T1B



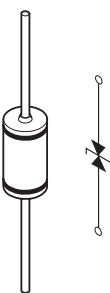
ERC06-15S  
MTZJ-T-77-5.1C  
MTZJ-T-775.6C  
MTZJ-T-77-7.5A  
MTZJ-T-77-8.2B  
MTZJ-T-77-10B  
MTZJ-T-7730D  
RD10ES-T1B



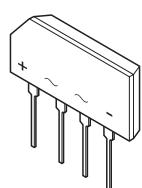
1SS83TD  
D1NL2OU-TA  
EL1Z-V1  
ERA22-08TP3  
GP08DPKG23  
RGP10GPKG23  
RU4AM-T3



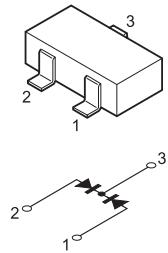
RD9.1EW-T1



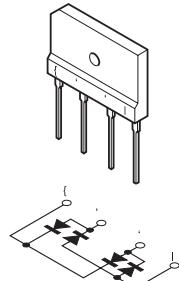
D2SB60A-F04



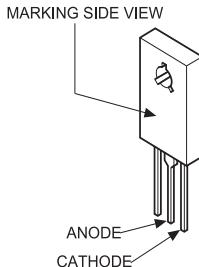
DAP202K-T-146



D4SB60L-F



D5LC20U



## SECTION 7

### EXPLODED VIEW

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The component parts of an assembly are indicated by the reference numbers in the remarks column.
- Items marked \* are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

**Note:**

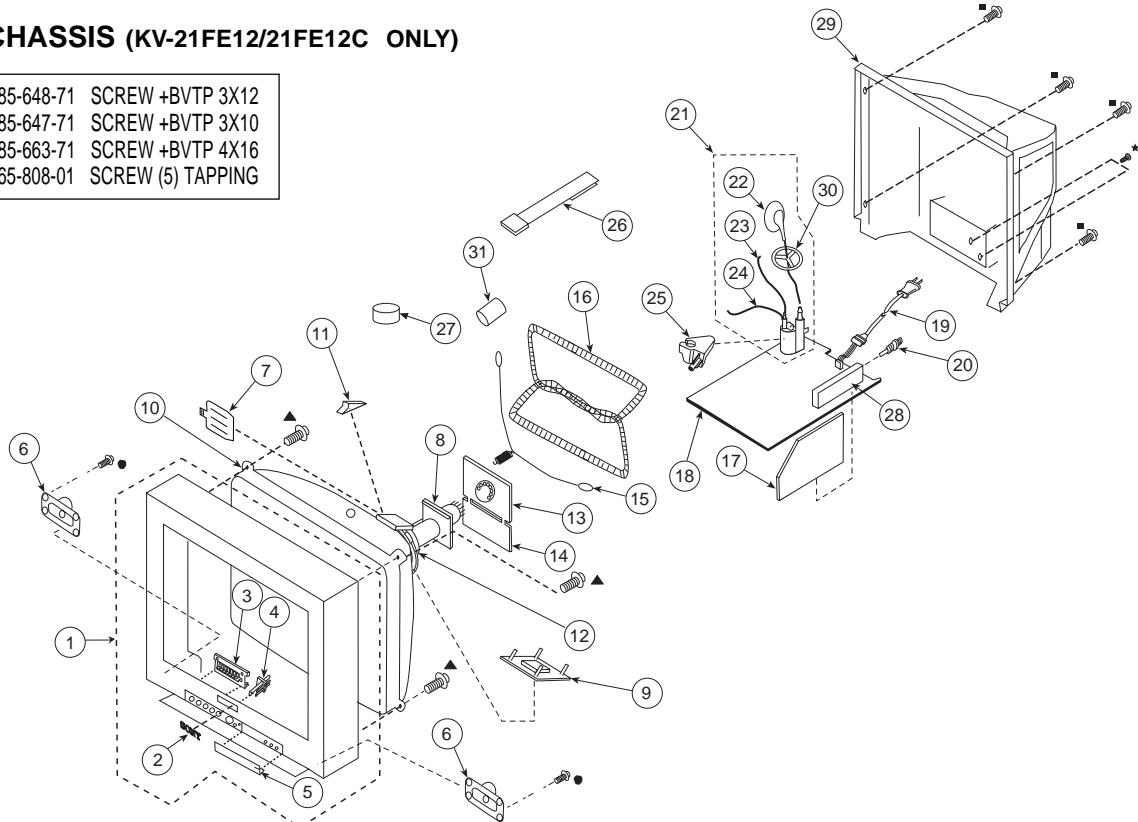
The components identified by shading and mark **△** are critical for safety. Replace only with part number specified.

**Note:**

Les composants identifiés par un trame et une marque **△** sont critiques pour la securité. Ne les remplacer que par une piece portant le numero specifie.

**7-1. CHASSIS (KV-21FE12/21FE12C ONLY)**

- 7-685-648-71 SCREW +BVTP 3X12
- ★ 7-685-647-71 SCREW +BVTP 3X10
- 7-685-663-71 SCREW +BVTP 4X16
- ▲ 4-365-808-01 SCREW (5) TAPPING



REF. NO.	PART NO.	DESCRIPTION	REMARK
1	X-4037-400-1	BEZNET ASSY	2-5
2	4-046-161-01	EMBLEM (NO.8), SONY	
3	4-073-931-01	BUTTON, MULTI	
4	4-073-933-01	GUIDE, LED	
5	4-073-932-11	DOOR	
6	1-529-613-11	SPEAKER (9X5CM)	
7	4-057-714-01	PIECE ASSY, TLH CORRECTION	
8	1-416-864-12	COIL, VM	
9	1-452-728-61	COIL, NA ROTATION (RT-154)	
10	△ 8-738-823-05	CRT 21RSN(FOR EQUATORIAL AREA) (KV-21FE12C ONLY)	
10	△ 8-738-822-05	CRT 21RSN(FOR NORTH AMERICA) (KV-21FE12 ONLY)	
11	4-053-005-01	SPACER, DY	
12	△ 8-451-505-31	DY Y21RSA-X	
13	* A-1332-035-A	CB (VAR) MOUNTED PC BOARD	
14	* A-1342-537-A	VB (VAR) MOUNTED PC BOARD	
15	* 4-375-394-01	SPRING, TENSION	
16	△ 1-419-288-21	COIL, DEGAUSSING	

REF. NO.	PART NO.	DESCRIPTION	REMARK
17	* A-1304-183-A	MB (VAR) MOUNTED PC BOARD	
18	* A-1299-174-A	A COMPLETE PC BOARD	
		The high-voltage leads associated with the FBT on this board are not included and must be ordered separately. (See 22-24)	
19	△ 1-790-316-21	CORD, AC POWER(WITH CONNECTOR) (KV-21FE12 ONLY)	
19	△ 1-769-796-31	CORD, POWER (WITH CONNECTOR) (KV-21FE12C ONLY)	
20	1-766-374-11	PLUG, F-PIN	
21	△ 1-453-316-21	FBT ASSY NX-1748//X4A4	22-24
22	1-251-642-52	HV CAP ASSY	
23	1-900-800-65	FOCUS LEAD	
24	1-900-803-22	G2 LEAD	
25	4-071-497-01	HOLDER, FBT	
26	4-062-047-01	PIECE A(110), CONV CORRECT	
27	1-452-032-00	MAGNET,DISC	
28	△ 8-598-431-30	TUNER, FSS BTF-WA411	
29	4-073-934-01	COVER, REAR	
30	3-704-372-31	HOLDER, HV CABLE	

**Note:**

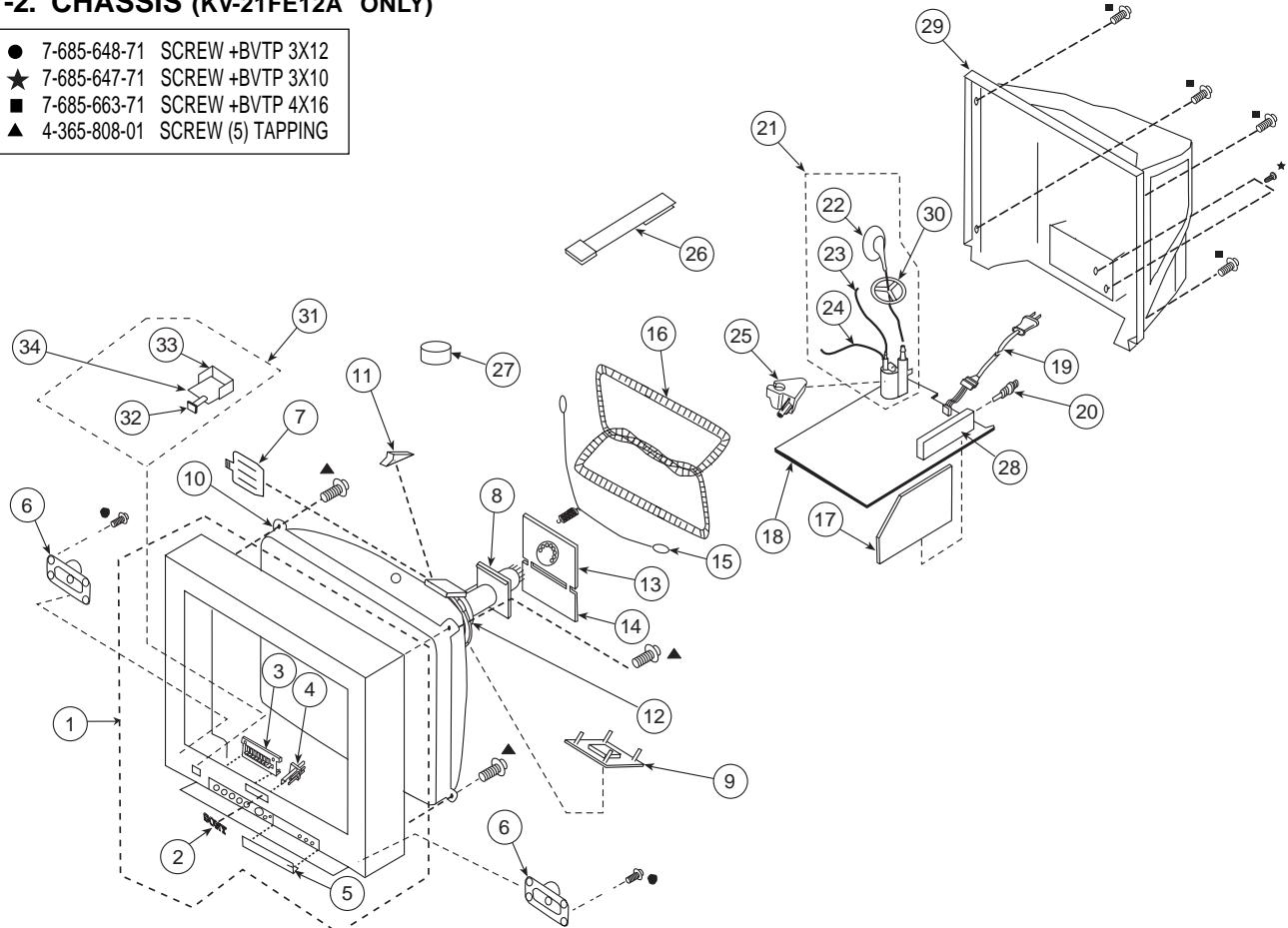
The components identified by shading and mark **▲** are critical for safety. Replace only with part number specified.

**Note:**

Les composants identifiés par un trame et une marque **▲** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

**7-2. CHASSIS (KV-21FE12A ONLY)**

- 7-685-648-71 SCREW +BTP 3X12
- ★ 7-685-647-71 SCREW +BTP 3X10
- 7-685-663-71 SCREW +BTP 4X16
- ▲ 4-365-808-01 SCREW (5) TAPPING



REF. NO.	PART NO.	DESCRIPTION	REMARK
1	X-4037-711-1	BEZNET ASSY, ARG	2-5
2	4-046-161-01	EMBLEM (NO.8), SONY	
3	4-073-931-01	BUTTON, MULTI	
4	4-073-933-11	GUIDE, LED	
5	4-073-932-11	DOOR	
6	1-529-613-11	SPEAKER (9X5CM)	
7	4-057-714-01	PIECE ASSY, TLH CORRECTION	
8	1-416-864-12	COIL, VM	
9	1-452-728-61	COIL, NA ROTATION (RT-154)	
10	▲ 8-738-823-05	CRT 21RSN(FOR EQUATORIAL AREA)	
11	4-053-005-01	SPACER, DY	
12	▲ 8-451-505-31	DY Y21RSA-X	
13	* A-1332-035-A	CB (VAR) MOUNTED PC BOARD	
14	* A-1342-537-A	VB (VAR) MOUNTED PC BOARD	
15	* 4-375-394-01	SPRING, TENSION	
16	▲ 1-419-288-21	COIL, DEGAUSSING	
17	A-1304-194-A	MB (VAR) MOUNTED PC BOARD	
18	A-1299-204-A	A COMPLETE PC BOARD**	

\*\*The high-voltage leads associated with the FBT on this board are not included and must be ordered separately. (See 22-24)

REF. NO.	PART NO.	DESCRIPTION	REMARK
19	▲ 1-783-838-31	CORD, POWER (WITH CONNECTOR)	
20	1-766-374-11	PLUG, F-PIN	
21	▲ 1-453-316-21	FBT ASSY NX-1748//X4A4	22-24
22	1-251-642-52	HV CAP ASSY	
23	1-900-800-65	FOCUS LEAD	
24	1-900-803-22	G2 LEAD	
25	4-071-497-01	HOLDER, FBT	
26	4-062-047-01	PIECE A(110), CONV CORRECT	
27	1-452-032-00	MAGNET,DISC	
28	▲ 8-598-542-00	TUNER, FSS BTF-WA412	
29	4-073-934-01	COVER, REAR	
30	3-704-372-31	HOLDER, HV CABLE	
31	A-1484-796-A	HZ BLOCK ASSY	32-34
32	4-074-687-01	BUTTON, POWER	
33	4-052-635-01	MAIN POWER BRACKET	
34	* A-1372-117-A	HZ MOUNTED PWB	

## Note:

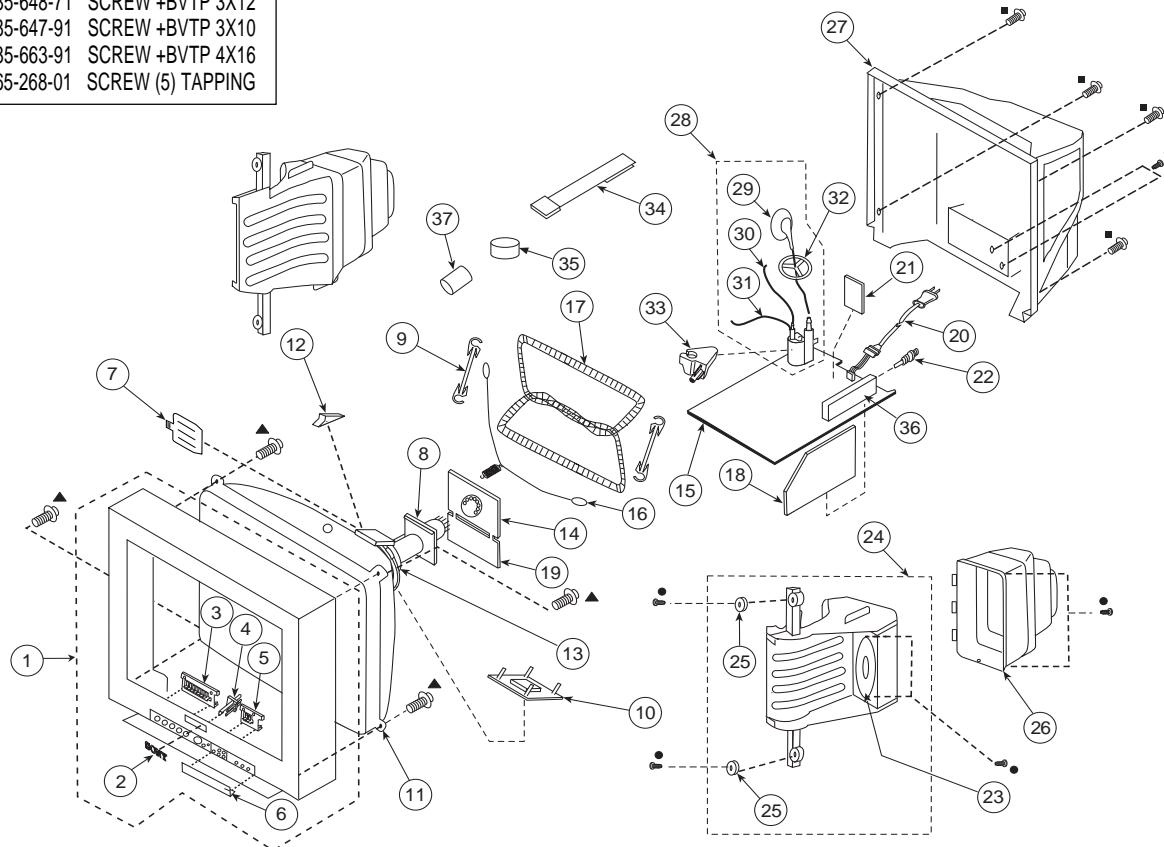
The components identified by shading and mark **▲** are critical for safety. Replace only with part number specified.

## Note:

Les composants identifiés par un trame et une marque **▲** sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

## 7-3. CHASSIS (KV-20FV12/21FV12/21FV12C ONLY)

- 7-685-648-71 SCREW +BTP 3X12
- ★ 7-685-647-91 SCREW +BTP 3X10
- 7-685-663-91 SCREW +BTP 4X16
- ▲ 4-365-268-01 SCREW (5) TAPPING



REF. NO.	PART NO.	DESCRIPTION	REMARK
1	X-4036-880-3	BEZNET ASSY	2-6
2	4-046-161-01	EMBLEM (NO.8), SONY	
3	4-068-307-04	BUTTON, MULTI	
4	4-068-308-01	GUIDE, LED	
5	4-068-309-04	BUTTON, FUNCTION	
6	4-068-306-03	DOOR	
7	4-057-714-01	PIECE ASSY, TLH CORRECTION	
8	1-416-864-12	COIL, VM	
9	* 4-064-883-03	HOLDER, DGC	
10	1-452-728-61	COIL, NA ROTATION (RT-154)	
11	▲ 8-738-823-05	CRT 21RSN(FOR EQUATORIAL AREA) (KV-21FV12C ONLY)	
11	▲ 8-738-822-05	CRT 21RSN(FOR NORTH AMERICA) (KV-20FV12/21FV12 ONLY)	
12	4-053-005-01	SPACER, DY	
13	▲ 8-451-505-31	DY Y21RSA-X	
14	* A-1332-035-A	CB (VAR) MOUNTED PC BOARD	
15	A-1299-183-A	A COMPLETE PC BOARD** (KV-20FV12 ONLY)	
15	* A-1299-201-A	A COMPLETE PC BOARD** (KV-21FV12/C ONLY)	
	**The high-voltage leads associated with the FBT on this board are not included and must be ordered separately. (See 29-31)		
16	* 4-375-394-01	SPRING, TENSION	
17	▲ 1-419-287-11	COIL, DEGAUSSING (KV-20FV12 ONLY)	
17	▲ 1-419-288-21	COIL, DEGAUSSING (KV-21FV12/C ONLY)	
18	* A-1304-188-A	MB (VAR) MOUNTED PC BOARD	

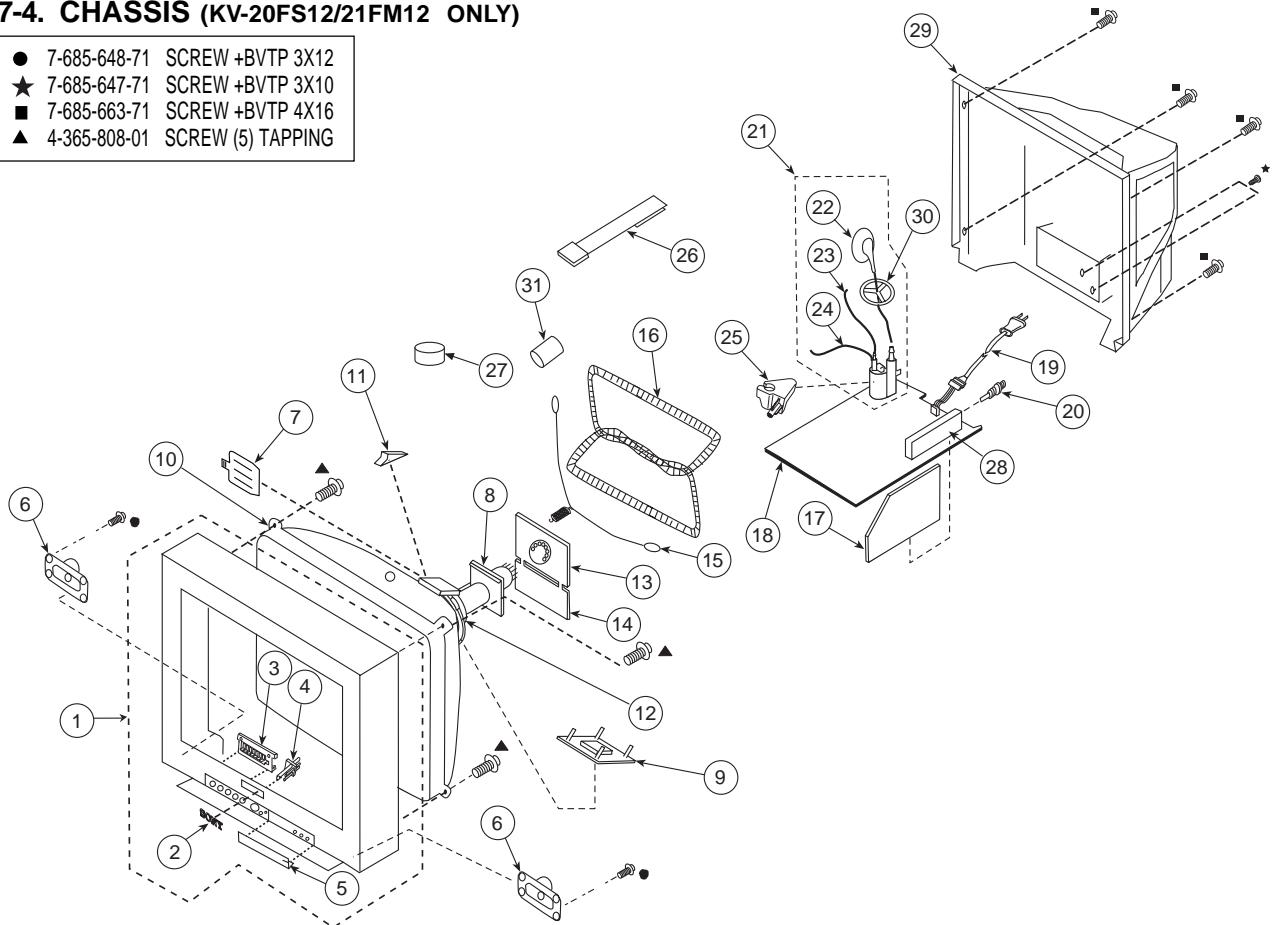
REF. NO.	PART NO.	DESCRIPTION	REMARK
19	* A-1342-537-A	VB (VAR) MOUNTED PC BOARD	
20	▲ 1-790-316-21	CORD, AC POWER (WITH CONNECTOR) (KV-20FV12/21FV12 ONLY)	
20	▲ 1-769-796-31	CORD, POWER (WITH CONNECTOR) (KV-21FV12C ONLY)	
21	* A-1380-627-A	K (VAR) MOUNTED PC BOARD	
22	1-766-374-11	PLUG, F-PIN	
23	1-529-472-11	SPEAKER (8CM) (KV-20FV12 ONLY)	
23	1-529-602-11	SPEAKER (8CM) (KV-21FV12/C ONLY)	
24	X-4036-947-1	SPEAKER DUCT ASSY	25
25	4-374-745-31	CUSHION (A)	
26	X-4036-935-1	SPEAKER BOX ASSY	
27	4-075-859-01	COVER, REAR	
28	▲ 1-453-316-21	FBT ASSY NX-1748//X4A4	29-31
29	1-251-642-52	HV CAP ASSY	
30	1-900-800-65	FOCUS LEAD	
31	1-900-803-22	G2 LEAD	
32	3-704-372-31	HOLDER, HV CABLE	
33	4-071-497-01	HOLDER, FBT	
34	4-062-047-01	PIECE A(110), CONV CORRECT	
35	1-452-032-00	MAGNET,DISC	
36	▲ 8-598-431-30	TUNER, FSS BTF-WA411	
37	1-500-586-11	FILTER CLAMP, FERRITE CORE (KV-20FV12 ONLY)	

**Note:**

The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

**7-4. CHASSIS (KV-20FS12/21FM12 ONLY)**

- 7-685-648-71 SCREW +BVTP 3X12
- ★ 7-685-647-71 SCREW +BVTP 3X10
- 7-685-663-71 SCREW +BVTP 4X16
- ▲ 4-365-808-01 SCREW (5) TAPPING

**Note:**

Les composants identifiés par un trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

REF. NO.	PART NO.	DESCRIPTION	REMARK
1	X-4037-547-1	BEZNET ASSY (KV-21FM12 ONLY)	2-5
1	X-4037-392-1	BEZNET ASSY (KV-20FS12 ONLY)	2-5
2	4-046-161-01	EMBLEM (NO.8), SONY	
3	4-073-931-11	BUTTON, MULTI (KV-21FM12 ONLY)	
3	4-073-843-01	BUTTON, MULTI (KV-20FS12 ONLY)	
4	4-073-933-01	GUIDE, LED (KV-21FM12 ONLY)	
4	4-073-844-01	GUIDE, LED (KV-20FS12 ONLY)	
5	4-073-932-21	DOOR (KV-21FM12 ONLY)	
5	4-073-842-11	DOOR (KV-20FS12 ONLY)	
6	1-529-270-11	SPEAKER (9X5CM)	
7	4-057-714-01	PIECE ASSY, TLH CORRECTION	
8	1-416-864-12	COIL, VM	
9	1-452-728-61	COIL, NA ROTATION (RT-154)	
10	▲ 8-738-822-05	CRT 21RSN(FOR NORTH AMERICA)	
11	4-053-005-01	SPACER, DY	
12	▲ 8-451-505-31	DY Y21RSA-X	
13	* A-1332-035-A	CB (VAR) MOUNTED PC BOARD	
14	* A-1342-537-A	VB (VAR) MOUNTED PC BOARD	
15	* 4-375-394-01	SPRING, TENSION	
16	▲ 1-419-288-21	COIL, DEGAUSSING (KV-21FM12 ONLY)	
16	▲ 1-419-287-11	COIL, DEGAUSSING (KV-20FS12 ONLY)	

REF. NO.	PART NO.	DESCRIPTION	REMARK
17	* A-1304-201-A	MB (VAR) MOUNTED PC BOARD (KV-21FM12 ONLY)	
17	* A-1304-183-A	MB (VAR) MOUNTED PC BOARD (KV-20FS12 ONLY)	
18	A-1299-182-A	A COMPLETE PC BOARD** (KV-20FS12 ONLY)	
18	* A-1299-189-A	A COMPLETE PC BOARD** (KV-21FM12 ONLY)	
		**The high-voltage leads associated with the FBT on this board are not included and must be ordered separately. (See 22-24)	
19	▲ 1-790-316-21	CORD, AC POWER(WITH CONNECTOR)	
20	1-766-374-11	PLUG, F-PIN	
21	▲ 1-453-316-21	FBT ASSY NX-1748//X4A4	22-24
22	1-251-642-52	HV CAP ASSY	
23	1-900-800-65	FOCUS LEAD	
24	1-900-803-22	G2 LEAD	
25	4-071-497-01	HOLDER, FBT (KV-21FM12 ONLY)	
26	4-062-047-01	PIECE A(110), CONV CORRECT	
27	1-452-032-00	MAGNET,DISC	
28	▲ 8-598-501-00	TUNER, FSS BTF-FA402 (KV-21FM12 ONLY)	
28	▲ 8-598-431-30	TUNER, FSS BTF-WA411 (KV-20FS12 ONLY)	
29	4-073-841-01	COVER, REAR (KV-20FS12 ONLY)	
29	4-073-934-01	COVER, REAR (KV-21FM12 ONLY)	
30	3-704-372-31	HOLDER, HV CABLE	
31	1-500-586-11	FILTER CLAMP, FERRITE CORE (KV-20FS12 ONLY)	

## SECTION 8

### ELECTRICAL PARTS LIST

**Note:**

The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

**A**
**Note:**

Les composants identifiés par un trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- The components identified by  $\square$  in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

- Items marked \* are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

**RESISTORS**

- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

REF. NO.	PART NO.	DESCRIPTION	REMARK			
		<b>A</b>				
* A-1299-174-A	A-1299-174-A	A COMPLETE PC BOARD (KV-21FE12/C ONLY)				
* A-1299-182-A	A-1299-182-A	A COMPLETE PC BOARD (KV-20FS12 ONLY)				
* A-1299-183-A	A-1299-183-A	A COMPLETE PC BOARD (KV-20FV12 ONLY)				
* A-1299-189-A	A-1299-189-A	A COMPLETE PC BOARD (KV-21FM12 ONLY)				
* A-1299-201-A	A-1299-201-A	A COMPLETE PC BOARD (KV-21FV12/C ONLY)				
* A-1299-204-A	A-1299-204-A	A COMPLETE PC BOARD (KV-21FE12A ONLY)				
The high voltage leads associated with the FBT on this board are not included and must be ordered separately. Order the following leads when requesting this A Board:						
1-251-642-52	HV CAP ASSY					
1-900-800-65	FOCUS LEAD					
1-900-803-22	G2 LEAD					
1-533-223-11	HOLDER, FUSE					
* 4-374-846-11	COVER, CAPACITOR, CAP TYPE					
4-382-854-11	SCREW (M3X10), P, SW (+)					
4-382-854-11	SCREW (M3X10), P, SW (+)					
<b>CAPACITOR</b>						
C100	1-164-346-11	CERAMIC CHIP	1 $\mu$ F	16V		
C101	1-164-346-11	CERAMIC CHIP	1 $\mu$ F	16V		
C102	1-126-933-11	ELECT	100 $\mu$ F	20%	16V	
C104	1-126-941-11	ELECT	470 $\mu$ F	20%	25V	
C105	1-104-664-11	ELECT	47 $\mu$ F	20%	25V	
C204	1-163-017-00	CERAMIC CHIP	0.0047 $\mu$ F	10%	50V	
C205	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	
C207	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	
	(KV-20FS12/21FM12/21FE12A ONLY)					
C208	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	
	(ALL EXCEPT KV-20FV12/21FV12/C)					
C210	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	
C214	1-164-346-11	CERAMIC CHIP	1 $\mu$ F		16V	
C215	1-164-346-11	CERAMIC CHIP	1 $\mu$ F		16V	
	(ALL EXCEPT KV-21FM12)					
C216	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	
C219	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	
C401	1-126-968-11	ELECT	100 $\mu$ F	20%	50V	
C402	1-126-943-11	ELECT	2200 $\mu$ F	20%	25V	
C403	1-126-957-11	ELECT	0.22 $\mu$ F	20%	50V	
C420	1-164-222-11	CERAMIC CHIP	0.22 $\mu$ F		25V	
C421	1-164-222-11	CERAMIC CHIP	0.22 $\mu$ F		25V	
	(ALL EXCEPT KV-21FM12)					
C435	1-164-222-11	CERAMIC CHIP	0.22UF		25V	
C438	1-126-940-11	ELECT	330 $\mu$ F	20%	25V	
C439	1-126-940-11	ELECT	330 $\mu$ F	20%	25V	
C440	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	
	(ALL EXCEPT KV-20FV12/21FV12/C)					
C441	1-164-346-11	CERAMIC CHIP	1 $\mu$ F		16V	
C442	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	
C443	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	
	(ALL EXCEPT KV-20FV12/21FV12/C)					
C444	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	
	(ALL EXCEPT KV-20FV12/21FV12/C)					
C445	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	
	(ALL EXCEPT KV-20FV12/21FV12/C)					
C446	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	
	(KV-20FS12/21FE12/A/C ONLY)					
C450	1-165-320-11	CERAMIC CHIP	0.47 $\mu$ F	10%	16V	
C501	1-102-112-00	CERAMIC	330PF	10%	50V	
C502	1-106-383-00	MYLAR	0.047 $\mu$ F	10%	200V	
C503	1-102-212-00	CERAMIC	820PF	10%	500V	
C504	1-102-002-00	CERAMIC	680PF	10%	500V	
C505	$\triangle$ 1-162-134-11	CERAMIC	470PF	10%	2KV	
C506	1-162-318-11	CERAMIC	0.001 $\mu$ F	10%	500V	
C507	$\triangle$ 1-117-642-11	FILM	8200PF	3%	1.2KV	
C508	1-137-150-11	MYLAR	0.01 $\mu$ F	10%	100V	

## Note:

The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

## Note:

Les composants identifiés par un trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

A

REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK					
C509	$\triangle$ 1-162-116-00	CERAMIC	680PF	10%	2KV	C621	1-117-214-11	CERAMIC	0.001 $\mu$ F	10%	2KV			
C510	1-107-651-11	ELECT	4.7 $\mu$ F	20%	250V	C622	1-164-625-11	CERAMIC	680PF	10%	500V			
C511	$\triangle$ 1-115-519-11	FILM	0.56 $\mu$ F	5%	250V	C623	1-164-625-11	CERAMIC	680PF	10%	500V			
C512	$\triangle$ 1-106-383-00	MYLAR	0.047 $\mu$ F	10%	200V	C624	1-131-867-51	ELECT	100 $\mu$ F	160V				
C513	1-106-343-00	MYLAR	0.001 $\mu$ F	10%	100V	C625	1-135-412-51	ELECT	1000 $\mu$ F	20%	25V			
C514	$\triangle$ 1-115-521-11	FILM	0.82 $\mu$ F	5%	250V	C625	1-135-573-51	ELECT	15000 $\mu$ F	20%	25V			
C515	$\triangle$ 1-162-116-00	CERAMIC	680PF	10%	2KV	(KV-21FV12/C ONLY)								
C516	1-117-214-11	CERAMIC	0.001 $\mu$ F	10%	2KV	C626	1-135-412-51	ELECT	1000 $\mu$ F	20%	25V			
C520	$\triangle$ 1-129-722-00	FILM	0.047 $\mu$ F	5%	630V	C627	1-136-189-00	MYLAR	0.1 $\mu$ F	10%	250V			
C521	1-164-646-11	CERAMIC	2200PF	10%	500V	C628	1-104-665-11	ELECT	100 $\mu$ F	20%	25V			
C523	1-126-941-11	ELECT	470 $\mu$ F	20%	25V	C630	1-113-924-11	CERAMIC	0.0047 $\mu$ F	20%	250V			
C524	1-102-244-00	CERAMIC	220PF	10%	500V	(KV-20FS12/20FV12 ONLY)								
C525	1-162-815-11	CERAMIC	47PF	5%	500V	C631	1-113-924-11	CERAMIC	0.0047 $\mu$ F	20%	250V			
C526	1-126-960-11	ELECT	1 $\mu$ F	20%	50V	(KV-20FS12/20FV12 ONLY)			C634					
C527	1-126-965-11	ELECT	22 $\mu$ F	20%	50V	1-137-605-11	MYLAR	0.01 $\mu$ F	10%	250V				
C528	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%	50V	C635	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V			
C529	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%	50V	C636	1-126-970-11	ELECT	330 $\mu$ F	20%	50V			
C530	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C637	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V			
C531	1-106-387-00	MYLAR	0.068 $\mu$ F	10%	200V	C638	1-163-005-11	CERAMIC CHIP	470PF	10%	50V			
C533	1-126-941-11	ELECT	470 $\mu$ F	20%	25V	C639	1-126-965-11	ELECT	22 $\mu$ F	20%	50V			
C534	$\triangle$ 1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C641	1-107-679-91	ELECT	10 $\mu$ F	20%	450V			
C535	1-126-959-11	ELECT	0.47 $\mu$ F	20%	50V	C643	1-104-760-11	CERAMIC CHIP	0.047 $\mu$ F	10%	50V			
C537	$\triangle$ 1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	C644	1-161-964-91	CERAMIC	0.0047 $\mu$ F	250V				
C539	1-107-645-11	ELECT	22 $\mu$ F	20%	160V	C645	1-161-964-91	CERAMIC	0.0047 $\mu$ F	250V				
C540	1-107-645-11	ELECT	22 $\mu$ F	20%	160V	C646	1-161-964-91	CERAMIC	0.0047 $\mu$ F	250V				
C541	1-126-969-11	ELECT	220 $\mu$ F	20%	50V	C647	1-161-964-91	CERAMIC	0.0047 $\mu$ F	250V				
C542	1-126-967-11	ELECT	47 $\mu$ F	20%	50V	C648	1-136-346-51	MYLAR	0.22 $\mu$ F	20%	125V			
C543	1-137-194-81	MYLAR	0.47 $\mu$ F	5%	50V	(KV-20FS12/20FV12 ONLY)			C648	1-136-346-61	MYLAR	0.22 $\mu$ F	20%	300V
C546	$\triangle$ 1-107-635-11	ELECT	4.7 $\mu$ F	20%	160V	C652	1-130-471-00	MYLAR	0.001 $\mu$ F	5%	50V			
C547	$\triangle$ 1-163-031-11	CERAMIC CHIP	0.01 $\mu$ F		50V	C654	1-107-636-11	ELECT	10 $\mu$ F	20%	160V			
C548	1-123-024-21	ELECT	33 $\mu$ F		160V	C655	$\triangle$ 1-136-311-51	MYLAR	0.47 $\mu$ F	20%	125V			
C549	$\triangle$ 1-126-934-11	ELECT	220 $\mu$ F	20%	16V	(KV-20FS12/20FV12 ONLY)			C655	$\triangle$ 1-136-311-61	MYLAR	0.47 $\mu$ F	20%	300V
C551	$\triangle$ 1-137-417-11	MYLAR	0.0047 $\mu$ F	10%	200V	C657	1-104-664-11	ELECT	47 $\mu$ F	20%	25V			
C553	1-107-662-11	ELECT	22 $\mu$ F	20%	250V	C658	1-135-412-51	ELECT	1000 $\mu$ F	20%	25V			
C557	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F		25V	C658	1-135-573-51	ELECT	15000 $\mu$ F	20%	25V			
C601	1-164-004-11	CERAMIC CHIP	0.1 $\mu$ F	10%	25V	C699	1-117-703-11	CERAMIC	0.0047 $\mu$ F	20%	250V			
C602	1-126-967-11	ELECT	47 $\mu$ F	20%	50V	C2001	1-104-664-11	ELECT	47 $\mu$ F	20%	25V			
C604	1-164-182-11	CERAMIC CHIP	0.0033 $\mu$ F	10%	50V									
C606	$\triangle$ 1-113-923-11	CERAMIC	0.0033 $\mu$ F	20%	250V									
C607	1-136-311-51	MYLAR	0.47 $\mu$ F	20%	125V									
			(KV-20FS12/20FV12 ONLY)											
C607	1-136-311-61	MYLAR	0.47 $\mu$ F	20%	300V									
C611	$\triangle$ 1-113-923-11	CERAMIC	0.0033 $\mu$ F	20%	250V									
C612	$\triangle$ 1-117-893-11	ELECT	470 $\mu$ F	20%	250V									
			(KV-20FS12/20FV12 ONLY)											
C612	$\triangle$ 1-128-714-11	ELECT	330 $\mu$ F	20%	400V									
C617	1-125-893-11	FILM	680PF	3%	1.5KV									
C618	1-164-081-11	CERAMIC	470PF	10%	50V									
C619	1-136-356-11	MYLAR	470PF	5%	50V									
C620	1-104-665-11	ELECT	100 $\mu$ F	20%	25V									

## CONNECTOR

CN403	*	1-564-505-11	PLUG, CONNECTOR 2P (ALL EXCEPT KV-20FV12/21FV12/C)
CN404	*	1-564-505-11	PLUG, CONNECTOR 2P (ALL EXCEPT KV-20FV12/21FV12/C)
CN406	*	1-564-507-11	PLUG, CONNECTOR 4P
CN460	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P (KV-20FV12/21FV12/C ONLY)	
CN501	*	1-580-798-11	CONNECTOR PIN (DY) 6P

**A****Note:**

The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

**Note:**

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REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
CN502 *	1-564-509-11	PLUG, CONNECTOR 6P		D614	8-719-063-70	DIODE D1NL20U-TA	
CN506 *	1-564-508-11	PLUG, CONNECTOR 5P		D615	8-719-312-10	DIODE RU4AM-T3	
CN601 *	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P		D616	8-719-510-37	DIODE D5LC20U	
CN602 * $\triangle$	1-580-843-11	PIN, CONNECTOR (POWER)		D617	8-719-110-31	DIODE MTZJ-T-77-12C	
CN2001*	1-564-511-11	PLUG, CONNECTOR 8P		D618	8-719-991-33	DIODE 1SS133T-77	
CN2002	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P		D619	8-719-110-17	DIODE MTZJ-T-77-10B	
CN2009	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P		D620	8-719-510-37	DIODE D5LC20U	
<b>DIODE</b>				D622 $\triangle$	8-719-077-76	DIODE D2SB60A-F04	
D204	8-719-982-22	DIODE MTZJ-T-77-30D		D623	8-719-948-45	DIODE ERA22-08TP3	
D208	8-719-110-17	DIODE MTZJ-T-77-10B		D624	8-719-991-33	DIODE 1SS133T-77	
D209	8-719-110-17	DIODE MTZJ-T-77-10B		D625	8-719-991-33	DIODE 1SS133T-77	
D210	8-719-110-17	DIODE MTZJ-T-77-10B		D626	8-719-063-70	DIODE D1NL20U-TA	
D212	8-719-110-17	DIODE MTZJ-T-77-10B		D627	8-719-110-03	DIODE MTZJ-T-77-7.5A	
D213	8-719-110-17	DIODE MTZJ-T-77-10B		D628	8-719-510-48	DIODE D1N20R-TA	
D230	8-719-108-12	DIODE RD9.1EW-T1 (KV-20FV12/21FV12/C ONLY)		D2001	8-719-070-80	DIODE LNK0120022G (KV-20FS12/21FM12/21FE12/C ONLY)	
D231	8-719-108-12	DIODE RD9.1EW-T1 (KV-20FV12/21FV12/C ONLY)		D2001	8-719-074-84	DIODE LNK0120022G1 (KV-20FV12/21FV12/C ONLY)	
D400	8-719-108-12	DIODE RD9.1EW-T1		D2001	8-719-078-12	DIODE LNK0220022G2 (KV-21FE12A ONLY)	
D401	8-719-110-08	DIODE MTZJ-T-77-8.2B		D2002	8-719-110-17	DIODE MTZJ-T-77-10B	
D403	8-719-073-01	DIODE MA111-TX (ALL EXCEPT KV-20FV12/21FV12/C)		D2003	8-719-108-12	DIODE RD9.1EW-T1	
D502	8-719-908-03	DIODE GP08DPKG23		D2004	8-719-921-44	DIODE MTZJ-T-77-5.1C	
D503	8-719-908-03	DIODE GP08DPKG23		D2005	8-719-921-44	DIODE MTZJ-T-77-5.1C	
D504 $\triangle$	8-719-945-80	DIODE ERC06-15S		<b>FUSE</b>			
D505 $\triangle$	8-719-979-85	DIODE RGP15GPKG23		F601 $\triangle$	1-576-193-11	FUSE 6.3A/125V (KV-20FS12/20FV12 ONLY)	
D506	8-719-302-43	DIODE RGP10GPKG3		F601 $\triangle$	1-532-506-51	FUSE 6.3A/250V	
D507 $\triangle$	8-719-991-33	DIODE 1SS133T-77		<b>FERRITE BEAD</b>			
D508	8-719-991-33	DIODE 1SS133T-77		FB501	1-410-397-21	FERRITE	1.1 $\mu$ H
D509	8-719-921-44	DIODE MTZJ-T-77-5.1C		FB502	1-410-397-21	FERRITE	1.1 $\mu$ H
D510	8-719-908-03	DIODE GP08DPKG23		FB503	1-410-397-21	FERRITE	1.1 $\mu$ H
D511	8-719-302-43	DIODE RGP10GPKG23		FB600	1-412-911-11	FERRITE	0 $\mu$ H
D513	8-719-979-85	DIODE RGP15GPKG23		FB601	1-412-911-11	FERRITE	0 $\mu$ H
D514	8-719-979-85	DIODE RGP15GPKG23		FB602	1-412-911-11	FERRITE	0 $\mu$ H
D516 $\triangle$	8-719-991-33	DIODE 1SS133T-77		FB603	1-412-911-11	FERRITE	0 $\mu$ H
D517 $\triangle$	8-719-991-33	DIODE 1SS133T-77		FB604	1-412-911-11	FERRITE	0 $\mu$ H
D518 $\triangle$	8-719-110-08	DIODE RD8.2ES-T1B		FB605	1-412-911-11	FERRITE	0 $\mu$ H
D519 $\triangle$	8-719-302-43	DIODE EL1Z-V1		FB606	1-412-911-11	FERRITE	0 $\mu$ H
D520 $\triangle$	8-719-073-01	DIODE MA111-TX		FB609	1-412-911-11	FERRITE	0 $\mu$ H
D601	8-719-991-33	DIODE 1SS133T-77		FB610	1-412-911-11	FERRITE	0 $\mu$ H
D602	8-719-991-33	DIODE 1SS133T-77		<b>IC</b>			
D605 $\triangle$	8-719-510-53	DIODE D4SB60L-F		IC401	8-759-490-17	IC TDA7057AQ/N2 (ALL EXCEPT KV-21FV12/C)	
D610	8-719-510-02	DIODE D1NS4-TA		IC402	8-759-573-40	IC TDA8580Q/N1 (KV-21FV12/C ONLY)	
D611	8-719-063-70	DIODE D1NL20U-TA					
D612	8-719-110-17	DIODE MTZJ-T-77-10B					
D613	8-719-063-70	DIODE D1NL20U-TA					

**Note:**

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REF.NO.	PART NO.	DESCRIPTION	REMARK
IC405	8-759-450-93	IC NJM2521M-TE1 (ALL EXCEPT KV-20FV12/21FV12/C)	
IC406	8-759-450-93	IC NJM2521M-TE1 (KV-20FS12/21FE12/A/C ONLY)	
IC501 $\triangle$	8-759-700-07	IC NJM2903M-TE2	
IC502	8-759-980-58	IC TDA8172	
IC601 $\triangle$	8-749-015-60	IC STR-F6624 (KV-20FS12/20FV12 ONLY)	
IC601 $\triangle$	8-749-013-75	IC STR-F6654	
IC602 $\triangle$	8-749-016-47	IC EA135-F12	
IC603	8-759-198-03	IC PQ09RF21	
IC604	8-759-701-75	IC NJM7805FA	
IC2001	8-742-134-00	HYB IC SBX1981-51P	

**JACK**

J201	1-794-118-11	JACK BLOCK, PIN 3P (KV-20FS12/21FE12/A/C ONLY)
J201	1-794-119-11	TERMINAL BLOCK, S 4P (KV-20FV12/21FV12/C ONLY)
J201	1-794-115-11	JACK BLOCK, PIN 2P (KV-21FM12 ONLY)
J202	1-794-267-11	JACK, PIN 3P
J202	1-794-266-21	JACK, PIN 2P (KV-21FM12 ONLY)
J205	1-794-116-11	JACK BLOCK, PIN 2P (KV-20FV12/21FV12/C ONLY)
J401	1-568-267-21	JACK

**CHIP CONDUCTOR**

JR001	1-216-295-91	SHORT
JR002	1-216-295-91	SHORT
JR202	1-216-295-91	SHORT (KV-20FS12/21FE12/A/C ONLY)
JR403	1-216-295-91	SHORT
JR405	1-216-295-91	SHORT (KV-21FV12/C ONLY)
JR409	1-216-295-91	SHORT (KV-20FS12/21FE12/A/C ONLY)
JR411	1-216-295-91	SHORT (KV-20FV12/21FV12/C ONLY)
JR412	1-216-295-91	SHORT (KV-20FS12/21FE12/A/C ONLY)
JR430	1-216-295-91	SHORT
JR470	1-216-295-91	SHORT (KV-21FM12 ONLY)
JR471	1-216-295-91	SHORT (KV-21FV12/C ONLY)
JR503	1-216-295-91	SHORT
JR505	1-216-295-91	SHORT (ALL EXCEPT KV-21FV12/C)

REF.NO.	PART NO.	DESCRIPTION	REMARK
<b>COIL</b>			
L101	1-414-267-11	INDUCTOR	10 $\mu$ H
L102	1-414-273-11	INDUCTOR	100 $\mu$ H
L103	1-414-267-11	INDUCTOR	10 $\mu$ H
L501 $\triangle$	1-409-955-11	INDUCTOR	8mH
L502	1-412-552-11	INDUCTOR	2.2mH
L503	1-406-677-11	INDUCTOR	10mH
L504	1-412-533-21	INDUCTOR	47 $\mu$ H
L508 $\triangle$	1-406-981-21	INDUCTOR	470 $\mu$ H
L510 $\triangle$	1-412-528-11	INDUCTOR	18 $\mu$ H
L603	1-412-529-11	INDUCTOR	22 $\mu$ H
L604	1-412-525-31	INDUCTOR	10 $\mu$ H
L605	1-412-529-11	INDUCTOR	22 $\mu$ H

**PHOTO COUPLER**

PH601 $\triangle$	8-749-010-64	PHOTO COUPLER PC123FY2
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**IC LINK**

PS401 $\triangle$	1-576-336-21	LINK, IC
PS401 $\triangle$	1-532-686-21	LINK, IC 2.7A/150V (KV-21FV12 / 21FV12C ONLY)

**TRANSISTOR**

Q101	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
Q410	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX (KV-20FV12 / 21FV12 / 21FV12C ONLY)
Q411	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX
Q501	8-729-140-50	TRANSISTOR 2SC3209LK-TP
Q502 $\triangle$	8-729-051-69	TRANSISTOR 2SD2624
Q503 $\triangle$	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
Q503 $\triangle$	8-729-120-28	TRANSISTOR 2SC2412K-T-146-QR (KV-21FM12 ONLY)
Q504	8-729-809-29	TRANSISTOR 2SC4159-E
Q505 $\triangle$	8-729-200-17	TRANSISTOR 2SA10910-TPE2
Q506 $\triangle$	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
Q506 $\triangle$	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX (KV-21FV12/C ONLY)
Q507 $\triangle$	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX
Q604	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
Q605 $\triangle$	8-729-046-40	TRANSISTOR 2SK2663
Q606	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
Q607	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW
Q608	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX
Q609	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA

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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
<b>RESISTOR</b>											
R101	1-216-073-00	RES-CHIP	10K	5%	1/10W	R433	1-216-113-00	RES-CHIP	470K	5%	1/10W
R103	1-216-295-91	SHORT	0			R436	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
		(KV-21FM12 ONLY)				R436	1-216-073-00	RES-CHIP	10K	5%	1/10W
R105	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R437	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R107	1-216-025-91	RES-CHIP	100	5%	1/10W	R437	1-216-073-00	RES-CHIP	10K	5%	1/10W
R108	1-216-025-91	RES-CHIP	100	5%	1/10W			(KV-20FV12/21FV12/C ONLY)			
R114	1-216-295-91	SHORT	0			R438	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
		(KV-21FM12 ONLY)						(KV-20FS12/21FE12/A/C ONLY)			
R115	1-216-295-91	SHORT	0			R438	1-216-073-00	RES-CHIP	10K	5%	1/10W
		(ALL EXCEPT KV-21FM12)				R439	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R204	1-216-083-00	RES-CHIP	27K	5%	1/10W	R439	1-216-073-00	RES-CHIP	10K	5%	1/10W
R205	1-216-689-11	RES-CHIP	39K	5%	1/10W			(KV-20FV12/21FV12/C ONLY)			
R206	1-216-295-91	SHORT	0			R439	1-216-089-91	RES-CHIP	47K	5%	1/10W
		(KV-21FM12 ONLY)				R440	1-216-097-91	RES-CHIP	100K	5%	1/10W
R208	1-215-899-11	METAL OXIDE	15K	5%	2W	R441	1-216-081-00	RES-CHIP	22K	5%	1/10W
R214	1-216-113-00	RES-CHIP	470K	5%	1/10W	R442	1-216-025-91	RES-CHIP	100	5%	1/10W
		(ALL EXCEPT KV-21FM12)				R443	1-216-033-00	RES-CHIP	220	5%	1/10W
R215	1-216-113-00	RES-CHIP	470K	5%	1/10W	R444	1-216-033-00	RES-CHIP	220	5%	1/10W
R235	1-216-089-91	RES-CHIP	47K	5%	1/10W	R445	1-216-073-00	RES-CHIP	10K	5%	1/10W
R237	1-216-033-00	RES-CHIP	220	5%	1/10W	R446	1-249-435-11	CARBON	33K	5%	1/4W
R238	1-216-033-00	RES-CHIP	220	5%	1/10W			(KV-20FV12/21FV12/C ONLY)			
R239	1-216-089-91	RES-CHIP	47K	5%	1/10W	R447	1-216-049-91	RES-CHIP	1K	5%	1/10W
R401	1-216-080-00	RES-CHIP	20K	5%	1/10W	R454	1-216-025-91	RES-CHIP	100	5%	1/10W
		(KV-21FV12/C ONLY)				R501	1-247-843-11	CARBON	3.3K	5%	1/4W
R402	1-216-073-00	RES-CHIP	10K	5%	1/10W	R502	$\triangle$ 1-215-892-11	METAL OXIDE	1K	5%	2W
R409	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R421	1-249-425-11	CARBON	4.7K	5%	1/4W	R503	$\triangle$ 1-249-426-11	CARBON	5.6K	5%	1/4W
R422	1-249-389-11	CARBON	4.7	5%	1/4W	R506	$\triangle$ 1-215-886-11	METAL OXIDE	100	5%	2W
R424	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R507	$\triangle$ 1-260-320-11	CARBON	220	5%	1/2W
		(ALL EXCEPT KV-20FV12/21FV12/C)				R508	1-247-863-91	CARBON	22K	5%	1/4W
R425	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R509	$\triangle$ 1-215-892-11	METAL OXIDE	1K	5%	2W
		(ALL EXCEPT KV-20FV12/21FM12/21FV12/C)									
R425	1-216-295-91	SHORT	0			R510	1-249-411-11	CARBON	330	5%	1/4W
		(KV-21FM12 ONLY)				R513	$\triangle$ 1-215-913-11	METAL OXIDE	220	5%	3W
R426	1-216-009-91	RES-CHIP	22	5%	1/10W	R516	1-249-429-11	CARBON	10K	5%	1/4W
		(KV-21FV12/C ONLY)				R517	1-249-425-11	CARBON	4.7K	5%	1/4W
R427	1-247-815-91	CARBON	220	5%	1/4W	R518	1-249-427-11	CARBON	6.8K	5%	1/4W
R428	1-216-033-00	RES-CHIP	220	5%	1/10W						
R429	1-216-113-00	RES-CHIP	470K	5%	1/10W	R519	1-249-427-11	CARBON	6.8K	5%	1/4W
		(KV-20FV12/21FV12/C ONLY)				R520	$\triangle$ 1-215-861-00	METAL OXIDE	47	5%	1W
R430	1-216-049-91	RES-CHIP	1K	5%	1/10W	R521	1-249-411-11	CARBON	330	5%	1/4W
		(KV-20FV12/21FV12/C ONLY)				R522	1-249-415-11	CARBON	680	5%	1/4W
R431	1-216-049-91	RES-CHIP	1K	5%	1/10W	R523	1-216-073-00	RES-CHIP	10K	5%	1/10W
		(KV-20FV12/21FV12/C ONLY)				R524	1-249-429-11	CARBON	10K	5%	1/4W
R432	1-216-073-00	RES-CHIP	10K	5%	1/10W	R525	$\triangle$ 1-216-069-00	RES-CHIP	6.8K	5%	1/10W
						R526	1-208-814-91	METAL CHIP	22K	0.50%	1/10W
R432	1-216-085-00	RES-CHIP	33K	5%	1/10W						

## Note:

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

## Note:

The components identified by  in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding x-ray radiation. Should replacement be required, replace only with the value originally used.



REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
R527	1-216-081-00	RES-CHIP	22K	5%	1/10W	R607	1-215-859-00	METAL OXIDE	22	5%	1W
R528	1-249-421-11	CARBON	2.2K	5%	1/4W	R608	1-240-205-11	CARBON	22M	5%	1/2W
R529	1-216-105-91	RES-CHIP	220K	5%	1/10W	R609	1-216-049-91	RES-CHIP	1K	5%	1/10W
R530	1-216-101-00	RES-CHIP	150K	5%	1/10W	R610	1-216-073-00	RES-CHIP	10K	5%	1/10W
R531	1-216-085-00	RES-CHIP	33K	5%	1/10W	R611	1-216-089-91	RES-CHIP	47K	5%	1/10W
R532	1-215-431-00	METAL	2.7K	1%	1/4W	R612	1-216-045-00	RES-CHIP	680	5%	1/10W
R533	1-215-461-00	METAL	47K	1%	1/4W	R613 	1-219-512-11	CARBON	2.2M	5%	1/2W
R534	1-215-455-00	METAL	27K	1%	1/4W	R614	1-249-413-11	CARBON	470	5%	1/4W
R535	1-249-441-11	CARBON	100K	5%	1/4W	R615 	1-218-265-11	METAL	8.2M	5%	1W (ALL EXCEPT KV-20FS12/20FV12)
R536 	1-216-355-11	METAL OXIDE	3.3	5%	1W	R616 	1-260-302-51	CARBON	6.8	5%	1/2W
R538 	1-215-890-11	METAL OXIDE	470	5%	2W	R617	1-216-009-91	RES-CHIP	22	5%	1/10W
R539	1-249-385-11	CARBON	2.2	5%	1/4W	R621	1-202-968-11	CEMENTED	1.2	5%	10W (ALL EXCEPT KV-20FS12/20FV12)
R540	1-249-425-11	CARBON	4.7K	5%	1/4W	R626 	1-220-926-11	FUSIBLE	0.47	10%	1/2W
R541	1-249-429-11	CARBON	10K	5%	1/4W	R627	1-215-483-00	METAL	390K	1%	1/4W (KV-20FS12/20FV12 ONLY)
R542 	1-215-910-00	METAL OXIDE	68	5%	3W	R627	1-215-479-00	METAL	270K	1%	1/4W
R543	1-247-887-00	CARBON	220K	5%	1/4W	R630	1-249-421-11	CARBON	2.2K	5%	1/4W
R544	1-260-312-11	CARBON	47	5%	1/2W	R632 	1-216-361-21	METAL OXIDE	0.22	5%	2W
R546 	1-249-377-11	CARBON	0.47	5%	1/4W	R633	1-249-415-11	CARBON	680	5%	1/4W
R547 	1-215-892-11	METAL OXIDE	1K	5%	2W	R634	1-216-073-00	RES-CHIP	10K	5%	1/10W
R549 	1-260-288-11	CARBON	0.47	5%	1/2W	R635	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R550 	1-260-288-11	CARBON	0.47	5%	1/2W	R637	1-216-485-11	METAL OXIDE	5.6K	5%	3W (ALL EXCEPT KV-20FS12/20FV12)
R552 	1-215-910-00	METAL OXIDE	68	5%	3W	R638	1-249-399-11	CARBON	33	5%	1/4W (KV-20FS12/20FV12 ONLY)
R553 	1-216-365-00	METAL OXIDE	0.47	5%	2W	R638	1-249-402-11	CARBON	56	5%	1/4W
R554 	1-249-429-11	CARBON	10K	5%	1/4W	R639	1-249-421-11	CARBON	2.2K	5%	1/4W
R555 	1-247-895-91	CARBON	470K	5%	1/4W	R640	1-249-417-11	CARBON	1K	5%	1/4W
R556 	1-249-416-11	CARBON	820	5%	1/4W	R641 	1-216-363-00	METAL OXIDE	0.33	5%	2W
R557 	1-247-895-91	CARBON	470K	5%	1/4W	R642	1-216-089-91	RES-CHIP	47K	5%	1/10W
R558 	1-249-441-11	CARBON	100K	5%	1/4W	R643	1-249-419-11	CARBON	1.5K	5%	1/4W
R559 	1-249-429-11	CARBON	10K	5%	1/4W	R644	1-247-843-11	CARBON	3.3K	5%	1/4W
R560 	1-215-902-11	METAL OXIDE	47K	5%	1W	R645	1-215-898-11	METAL OXIDE	10K	5%	2W
R561 	1-215-416-00	METAL	620	1%	1/4W	R646	1-249-419-11	CARBON	1.5K	5%	1/4W
 R562 	1-208-806-11	METAL CHIP	10K	0.50%	1/10W	R648	1-215-908-00	METAL OXIDE	33	5%	3W
R563 	1-249-441-11	CARBON	100K	5%	1/4W	R650	1-216-387-11	METAL OXIDE	0.68	5%	3W
R565 	1-249-429-11	CARBON	10K	5%	1/4W	R653	1-216-049-91	RES-CHIP	1K	5%	1/10W
R566 	1-216-073-00	RES-CHIP	10K	5%	1/10W	R655	1-216-049-91	RES-CHIP	1K	5%	1/10W
R567 	1-216-073-00	RES-CHIP	10K	5%	1/10W	R656	1-249-429-11	CARBON	10K	5%	1/4W
R568 	1-215-882-00	METAL OXIDE	22	5%	2W	R658	1-216-387-11	METAL OXIDE	0.68	5%	3W
R571	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R659	1-215-857-11	METAL OXIDE	10	5%	1W
R572	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R660	1-215-924-00	METAL OXIDE	15K	5%	3W (KV-20FS12/20FV12 ONLY)
R573	1-216-109-00	RES-CHIP	330K	5%	1/10W	R660	1-216-485-11	METAL OXIDE	5.6K	5%	3W
R601 	1-219-513-11	CARBON	4.7M	5%	1/2W (KV-20FS12/20FV12 ONLY)	R661	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R602 	1-249-389-11	CARBON	4.7	5%	1/4W	R662 	1-216-485-11	METAL OXIDE	5.6K	5%	3W (ALL EXCEPT KV-20FS12/20FV12)
R603	1-215-485-00	METAL	470K	1%	1/4W	R663	1-216-081-00	RES-CHIP	22K	5%	1/10W
R605 	1-205-998-11	CEMENTED	1	5%	10W (KV-20FS12/20FV12 ONLY)						
R606	1-205-998-11	CEMENTED	1	5%	10W (KV-20FS12/20FV12 ONLY)						
R606	1-202-968-11	CEMENTED	1.2	5%	10W						

A CB

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REF.NO.	PART NO.	DESCRIPTION	REMARK		
R2001	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R2002	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R2003	1-249-425-11	CARBON	4.7K	5%	1/4W
R2004	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R2005	1-216-295-91	SHORT			
		(ALL EXCEPT KV-20FV12/21FV12/C)			
R2007	1-249-413-11	CARBON	470	5%	1/4W
		(KV-21FE12A ONLY)			
R2011	1-249-415-11	CARBON	680	5%	1/4W
R2012	1-249-416-11	CARBON	820	5%	1/4W
R2013	1-249-421-11	CARBON	2.2K	5%	1/4W
R2014	1-249-427-11	CARBON	6.8K	5%	1/4W

REF.NO.	PART NO.	DESCRIPTION	REMARK
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THP601 $\triangle$	1-809-539-11	THERMISTOR, POSITIVE (KV-20FS12/20FV12 ONLY)
THP601 $\triangle$	1-803-540-11	THERMISTOR

TUNER

TU101 $\triangle$	8-598-542-00	TUNER, FSS BTF-WA412 (KV-21FE12A ONLY)
TU101 $\triangle$	8-598-431-30	TUNER, FSS BTF-WA411 (ALL EXCEPT KV-21FM12/21FE12A)
TU101 $\triangle$	8-598-501-00	TUNER, FSS BTF-FA402 (KV-21FM12 ONLY)

RELAY

RY601 $\triangle$	1-755-198-11	RELAY
RY602 $\triangle$	1-755-266-11	RELAY, AC POWER

VARISTOR

VDR601 $\triangle$	1-803-585-11	VARISTOR ENE271D-10A (KV-20FS12/20FV12 ONLY)
VDR601 $\triangle$	1-803-967-11	VARISTOR (ENE621D-14A)

SWITCH

S2001	1-692-431-21	SWITCH, TACTILE
S2002	1-692-431-21	SWITCH, TACTILE
S2003	1-692-431-21	SWITCH, TACTILE
S2004	1-692-431-21	SWITCH, TACTILE
S2005	1-692-431-21	SWITCH, TACTILE
S2006	1-692-431-21	SWITCH, TACTILE
S2007	1-762-816-11	SWITCH, TACTILE
S2008	1-762-816-11	SWITCH, TACTILE

CB

\* A-1332-035-A CB (VAR) MOUNTED PC BOARD  
4-382-854-11 SCREW (M3X10), P, SW (+)

SWITCH

SW502	1-572-707-11	SWITCH, LEVER
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CAPACITOR

C701	1-104-664-11	ELECT	47 $\mu$ F	20%	25V
C702	1-136-165-00	MYLAR	0.1 $\mu$ F	5%	50V
C703	1-104-664-11	ELECT	47 $\mu$ F	20%	25V
C704	1-107-649-11	ELECT	2.2 $\mu$ F	20%	250V
C705	1-107-652-11	ELECT	10 $\mu$ F	20%	250V
C707	1-162-114-00	CERAMIC	0.0047 $\mu$ F		2KV
C708	1-136-165-00	MYLAR	0.1 $\mu$ F	5%	50V
C709	1-126-934-11	ELECT	220 $\mu$ F	20%	16V
C710	1-126-964-11	ELECT	10 $\mu$ F	20%	50V

CONNECTOR

CN701 *	1-564-506-11	PLUG, CONNECTOR 3P
CN702	1-695-915-11	TAB (CONTACT)
CN704	1-784-281-11	HOUSING, CONNECTOR 1P
CN705 *	1-564-512-11	PLUG, CONNECTOR 9P
CN706 *	1-564-509-11	PLUG, CONNECTOR 6P

THERMISTOR

TH601 $\triangle$	1-803-586-11	THERMISTOR, NTC
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**CB HZ K**

<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>	<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>
<b>DIODE</b>							
D701	8-719-901-83	DIODE 1SS83TD					
D702	8-719-901-83	DIODE 1SS83TD					
D703	8-719-901-83	DIODE 1SS83TD					
D704	8-719-302-43	DIODE RGP10GPKG23					
<b>IC</b>							
IC701	8-759-803-42	IC LA6500-FA					
IC702	8-759-562-43	IC TDA6108JF/N1B					
<b>JACK</b>							
J701	$\triangle$ 1-451-470-21	SOCKET, CRT					
<b>COIL</b>							
L701	1-408-613-31	INDUCTOR	68 $\mu$ H				
<b>TRANSISTOR</b>							
Q700	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA					
Q701	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA					
<b>RESISTOR</b>							
R700	1-247-863-91	CARBON	22K	5%	1/4W		
R701	1-249-429-11	CARBON	10K	5%	1/4W		
R702	1-247-815-91	CARBON	220	5%	1/4W		
R703	1-247-807-31	CARBON	100	5%	1/4W		
R704	1-249-421-11	CARBON	2.2K	5%	1/4W		
R705	1-216-073-00	RES-CHIP	10K	5%	1/10W		
R706	1-249-381-11	CARBON	1	5%	1/4W		
R707	1-249-383-11	CARBON	1.5	5%	1/4W		
R708	1-247-807-31	CARBON	100	5%	1/4W		
R709	1-247-807-31	CARBON	100	5%	1/4W		
R710	1-247-807-31	CARBON	100	5%	1/4W		
R711	1-260-099-11	CARBON	1K	5%	1/2W		
R712	1-260-099-11	CARBON	1K	5%	1/2W		
R713	1-260-099-11	CARBON	1K	5%	1/2W		
R714	1-260-087-11	CARBON	100	5%	1/2W		
R715	1-260-132-11	CARBON	560K	5%	1/2W		
R716	1-260-123-11	CARBON	100K	5%	1/2W		
R718	1-216-375-00	METAL OXIDE	3.3	5%	2W		
R719	1-215-888-00	METAL OXIDE	220	5%	2W		
R720	1-249-421-11	CARBON	2.2K	5%	1/4W		
R721	1-249-421-11	CARBON	2.2K	5%	1/4W		
<b>VARIABLE RESISTOR</b>							
RV701	1-241-656-11	RES, ADJ, METAL FILM					110M
<b>HZ</b>							
<b>CONNECTOR</b>							
CN901	*	1-580-843-11	PIN, CONNECTOR (POWER)				
CN902	*	1-580-843-11	PIN, CONNECTOR (POWER)				
<b>SWITCH</b>							
S901	$\triangle$ 1-571-433-21	SWITCH, PUSH (AC POWER)					
<b>K</b>							
<b>K (VAR) MOUNTED PC BOARD</b>							
<b>CAPACITOR</b>							
C201	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C202	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C404	1-164-182-11	CERAMIC CHIP			0.0033 $\mu$ F	10.00%	50V
C405	1-163-034-00	CERAMIC CHIP			0.033 $\mu$ F		50V
C406	1-163-011-11	CERAMIC CHIP			0.0015 $\mu$ F	10.00%	50V
C407	1-164-222-11	CERAMIC CHIP			0.22 $\mu$ F		25V
C408	1-164-222-11	CERAMIC CHIP			0.22 $\mu$ F		25V
C409	1-163-011-11	CERAMIC CHIP			0.0015 $\mu$ F	10.00%	50V
C410	1-163-034-00	CERAMIC CHIP			0.033 $\mu$ F		50V
C411	1-164-182-11	CERAMIC CHIP			0.0033 $\mu$ F	10.00%	50V
C412	1-163-038-91	CERAMIC CHIP			0.1 $\mu$ F		25V
C413	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C414	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C415	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C416	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C417	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C418	1-163-038-91	CERAMIC CHIP			0.1 $\mu$ F		25V
C419	1-164-346-11	CERAMIC CHIP			1 $\mu$ F		16V
C422	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C423	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C450	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C451	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C458	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C459	1-126-963-11	ELECT			4.7 $\mu$ F	20.00%	50V
C460	1-126-965-11	ELECT			22 $\mu$ F	20.00%	50V

K MB

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REF.NO.	PART NO.	DESCRIPTION	REMARK		REF.NO.	PART NO.	DESCRIPTION	REMARK	
<b>CONNECTOR</b>									
CN450	1-573-301-21	CONNECTOR, BOARD TO BOARD 20P			C1002	1-107-698-11	ELECT (KV-21FV12/21FV12/C ONLY)	10 $\mu$ F	20%
<b>IC</b>									
IC404	8-759-658-01	IC NJW1130G			C1005	1-163-259-91	CERAMIC CHIP	220PF	5%
<b>CHIP CONDUCTOR</b>									
JR402	1-216-295-91	SHORT			C1008	1-126-964-11	ELECT	10 $\mu$ F	20%
JR405	1-216-295-91	SHORT			C1010	1-163-035-00	CERAMIC CHIP	0.047 $\mu$ F	50V
JR406	1-216-295-91	SHORT			C1011	1-163-259-91	CERAMIC CHIP	220PF	5%
JR407	1-216-295-91	SHORT			C1012	1-126-960-11	ELECT	1 $\mu$ F	20%
JR408	1-216-295-91	SHORT			C1013	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%
JR420	1-216-295-91	SHORT			C1014	1-130-495-00	MYLAR	0.1 $\mu$ F	5%
JR421	1-216-295-91	SHORT			C1015	1-163-231-11	CERAMIC CHIP	15PF	50V
JR422	1-216-295-91	SHORT			C1016	1-163-231-11	CERAMIC CHIP	15PF	5%
JR426	1-216-295-91	SHORT			C1018	1-126-960-11	ELECT	1 $\mu$ F	20%
JR427	1-216-295-91	SHORT			C1019	1-104-664-11	ELECT	47 $\mu$ F	20%
JR428	1-216-295-91	SHORT			C1020	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%
JR429	1-216-295-91	SHORT			C1021	1-163-259-91	CERAMIC CHIP	220PF	5%
JR450	1-216-295-91	SHORT			C1022	1-163-135-00	CERAMIC CHIP	560PF	5%
JR451	1-216-295-91	SHORT			C1023	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%
JR452	1-216-295-91	SHORT			C1024	1-163-259-91	CERAMIC CHIP	220PF	50V
<b>RESISTOR</b>									
R403	1-216-025-91	RES-CHIP	100	5%	C1026	1-163-259-91	CERAMIC CHIP	220PF	5%
R404	1-216-025-91	RES-CHIP	100	5%	C1027	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V
R405	1-216-025-91	RES-CHIP	100	5%	C1028	1-163-259-91	CERAMIC CHIP	220PF	5%
R406	1-216-025-91	RES-CHIP	100	5%	C1029	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%
R407	1-216-025-91	RES-CHIP	100	5%	C1030	1-115-566-11	CERAMIC CHIP	4.7 $\mu$ F	10.00%
R408	1-216-025-91	RES-CHIP	100	5%	(KV-20FS12/21FE12/A/C ONLY)				
R409	1-216-025-91	RES-CHIP	100	5%	C1031	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%
R410	1-216-025-91	RES-CHIP	100	5%	C1032	1-163-133-00	CERAMIC CHIP	470PF	5%
R450	1-216-025-91	RES-CHIP	100	5%	C1034	1-163-259-91	CERAMIC CHIP	220PF	50V
R451	1-216-025-91	RES-CHIP	100	5%	C1035	1-163-133-00	CERAMIC CHIP	470PF	5%
<b>MB</b>									
* A-1304-183-A MB (VAR) MOUNTED PC BOARD (KV-20FS12/20FE12/C/21FM12 ONLY)									
* A-1304-188-A MB (VAR) MOUNTED PC BOARD (KV 20FV12/21FV12/C ONLY)									
* A-1304-194-A MB (VAR) MOUNTED PC BOARD (KV-21FE12A ONLY)									
* A-1304-201-A MB (VAR) MOUNTED PC BOARD (KV-21FM12 ONLY)									
C1040 1-163-010-11 CERAMIC CHIP 0.0012 $\mu$ F 10% 50V									
C1041 1-126-935-11 ELECT 470 $\mu$ F 20% 16V									
C1042 1-164-161-11 CERAMIC CHIP 0.0022 $\mu$ F 10% 50V									
C1043 1-163-809-11 CERAMIC CHIP 0.047 $\mu$ F 10% 25V									
C1048 1-137-194-81 MYLAR 0.47 $\mu$ F 5% 50V									
C1049 1-163-017-00 CERAMIC CHIP 0.0047 $\mu$ F 10% 50V									
C1050 1-163-037-11 CERAMIC CHIP 0.022 $\mu$ F 10% 50V									
C1053 1-163-229-11 CERAMIC CHIP 12PF 5% 50V									
C1055 1-163-229-11 CERAMIC CHIP 12PF 5% 50V									
C1056 1-163-009-11 CERAMIC CHIP 0.001 $\mu$ F 10% 50V									
C1058 1-163-009-11 CERAMIC CHIP 0.001 $\mu$ F 10% 50V									
C1060 1-163-009-11 CERAMIC CHIP 0.001 $\mu$ F 10% 50V									
C1066 1-163-009-11 CERAMIC CHIP 0.001 $\mu$ F 10% 50V									
C1068 1-163-009-11 CERAMIC CHIP 0.001 $\mu$ F 10% 50V									
C1071 1-163-009-11 CERAMIC CHIP 0.001 $\mu$ F 10% 50V									
C1072 1-163-259-91 CERAMIC CHIP 220PF 5% 50V									

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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
C1073	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	C1356	1-163-259-91	CERAMIC CHIP (KV-21FE12A ONLY)	220PF	5.00%	50V
C1074	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	C1357	1-163-038-91	CERAMIC CHIP	0.1µF		25V
C1075	1-126-935-11	ELECT	470µF	20%	16V	C1358	1-126-963-11	ELECT	4.7µF	20%	50V
C1076	1-126-959-11	ELECT	0.47µF	20%	50V	C1359	1-126-964-11	ELECT	10µF	20%	50V
C1077	1-126-964-11	ELECT	10µF	20%	50V	C1361	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C1099	1-163-009-11	CERAMIC CHIP	0.001µF	10%	50V	C1363	1-163-233-11	CERAMIC CHIP (KV-21FE12A ONLY)	18PF	5.00%	50V
C1304	1-126-959-11	ELECT	0.47µF	20%	50V	C1364	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C1305	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1365	1-163-233-11	CERAMIC CHIP (KV-21FE12A ONLY)	18PF	5.00%	50V
C1306	1-126-933-11	ELECT	100µF	20%	16V	C1366	1-126-964-11	ELECT	10µF	20%	50V
C1307	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1367	1-126-964-11	ELECT (KV-20FV12/21FV12/C ONLY)	10µF	20%	50V
C1308	1-126-933-11	ELECT	100µF	20%	16V	C1375	1-163-034-00	CERAMIC CHIP	0.033µF		50V
C1309	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1376	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1310	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1377	1-126-960-11	ELECT	1µF	20%	50V
C1311	1-163-038-91	CERAMIC CHIP	0.1µF		25V	C1378	1-163-038-91	CERAMIC CHIP	0.1µF	25V	
C1313	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1379	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V
C1315	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1379	1-163-017-00	CERAMIC CHIP (KV-21FE12A ONLY)	0.0047µF	10.00%	
C1320	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1380	1-163-003-11	CERAMIC CHIP	330PF	10%	50V
C1321	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1381	1-163-038-91	CERAMIC CHIP	0.1µF	25V	
C1322	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1382	1-126-964-11	ELECT	10µF	20%	50V
C1323	1-126-933-11	ELECT	100µF	20%	16V	C1385	1-126-964-11	ELECT	10µF	20%	50V
C1324	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1386	1-163-038-91	CERAMIC CHIP	0.1µF		25V
C1325	1-163-123-00	CERAMIC CHIP	180PF	5%	50V	C1387	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C1326	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	C1389	1-163-038-91	CERAMIC CHIP (KV-20FV12/21FV12/C ONLY)	0.1µF		25V
C1327	1-126-933-11	ELECT	100µF	20%	16V	C1392	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C1328	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V	C1394	1-104-664-11	ELECT	47µF	20%	25V
C1329	1-163-010-11	CERAMIC CHIP	0.0012µF	10%	50V	C1399	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1330	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	<b>CONNECTOR</b>					
C1331	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	CN1001	* 1-564-511-11	PLUG, CONNECTOR	8P		
C1332	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	CN1002	* 1-560-124-00	PLUG, CONNECTOR (2.5MM)	4P		
C1334	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	CN1003	1-573-301-21	CONNECTOR, BOARD TO 20P			
C1335	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	CN1004	1-573-301-21	CONNECTOR, BOARD TO 20P			
C1336	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	<b>DIODE</b>					
C1339	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	D1001	8-719-921-44	DIODE MTZJ-T-77-5.1C			
C1340	1-126-963-11	ELECT	4.7µF	20%	50V	D1003	8-719-976-99	DIODE UDZ-TE-17-5.1B			
C1341	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	D1005	8-719-109-89	DIODE MTZJ-T-77-5.6C			
C1342	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	D1006	8-719-073-01	DIODE MA111-TX (KV-20FS12/21FE12/A/C ONLY)			
C1343	1-163-038-91	CERAMIC CHIP	0.1µF		25V	D1010	8-719-977-22	DIODE UDZ-TE-17-9.1B			
C1344	1-126-935-11	ELECT	470µF	20%	16V	D1011	8-719-073-01	DIODE MA111-TX			
C1345	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	D1012	8-719-073-01	DIODE MA111-TX			
C1349	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V	D1013	8-719-977-22	DIODE UDZ-TE-17-9.1B			
C1350	1-163-021-91	CERAMIC CHIP	0.01µF	10%	50V						
C1351	1-126-963-11	ELECT	4.7µF	20%	50V						
C1352	1-104-664-11	ELECT	47µF	20%	25V						
C1353	1-126-964-11	ELECT	10µF	20%	50V						
C1354	1-126-959-11	ELECT	0.47µF	20%	50V						
C1354	1-126-957-11	ELECT (KV-21FE12A ONLY)	0.22µF	20.00%	50V						
C1355	1-126-767-11	ELECT	1000µF	20%	16V						
C1356	1-163-133-00	CERAMIC CHIP	470PF	5%	50V						

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<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>	<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>				
D1014	8-719-073-01	DIODE MA111-TX		JR1083	1-216-295-91	SHORT					
D1301	8-719-914-44	DIODE DAP202K-T-146				(ALL EXCEPT KV-20FV12/21FV12/C/21FE12A)					
D1310	8-719-976-99	DIODE UDZ-TE-17-5.1B		JR1300	1-216-295-91	SHORT					
<b>FERRITE BEAD</b>											
FB1301	1-412-911-11	FERRITE	0μH	JR1304	1-216-295-91	SHORT					
FB1302	1-412-911-11	FERRITE	0μH	JR1305	1-216-295-91	SHORT					
<b>FILTER</b>											
FL1301	1-239-847-11	FILTER, LOW PASS		JR1309	1-216-295-91	SHORT					
FL1302	1-239-847-11	FILTER, LOW PASS		JR1310	1-216-295-91	SHORT					
FL1303	1-239-847-11	FILTER, LOW PASS		JR1311	1-216-295-91	SHORT					
<b>IC</b>											
IC1001	8-759-658-03	IC M37273MF-258SP		JR1312	1-216-295-91	SHORT					
IC1002	8-759-353-00	IC NJM2534M(TE2) (KV-20FV12/21FV12/C ONLY)		JR1313	1-216-295-91	SHORT					
IC1003	8-759-527-77	IC M24C16-MN6T		JR1314	1-216-295-91	SHORT					
IC1301	8-752-092-17	IC CXA2131AS		JR1315	1-216-295-91	SHORT					
IC1301	8-752-090-40	IC CXA2135S (KV-21FE12A ONLY)		JR1316	1-216-295-91	SHORT					
IC1302	8-759-655-75	IC TC90A49P		JR1317	1-216-295-91	SHORT					
IC1304	8-759-353-00	IC NJM2534M(TE2)		JR1318	1-216-295-91	SHORT					
IC1305	8-759-658-02	IC BA3993F		JR1319	1-216-295-91	SHORT					
<b>CHIP CONDUCTOR</b>											
JR0002	1-216-295-91	SHORT		JR1320	1-216-295-91	SHORT					
JR1000	1-216-295-91	SHORT		JR1321	1-216-295-91	SHORT					
JR1001	1-216-295-91	SHORT		JR1322	1-216-295-91	SHORT					
JR1002	1-216-295-91	SHORT		JR1323	1-216-295-91	SHORT					
JR1003	1-216-295-91	SHORT		JR1324	1-216-295-91	SHORT					
JR1004	1-216-295-91	SHORT		JR1325	1-216-295-91	SHORT					
JR1005	1-216-295-91	SHORT		<b>COIL</b>							
JR1006	1-216-295-91	SHORT		L1001	1-414-273-11	INDUCTOR	100μH				
JR1007	1-216-295-91	SHORT		L1003	1-414-273-11	INDUCTOR	100μH				
JR1008	1-216-295-91	SHORT		L1004	1-410-463-11	INDUCTOR	2.7μH				
JR1009	1-216-295-91	SHORT		L1302	1-414-267-11	INDUCTOR	10μH				
JR1010	1-216-295-91	SHORT		L1303	1-414-267-11	INDUCTOR	10μH				
JR1011	1-216-295-91	SHORT		L1304	1-414-267-11	INDUCTOR	10μH				
JR1012	1-216-295-91	SHORT		L1305	1-414-267-11	INDUCTOR	10μH				
JR1013	1-216-295-91	SHORT		L1310	1-414-267-11	INDUCTOR	10μH				
JR1014	1-216-295-91	SHORT		L1311	1-414-271-11	INDUCTOR	47μH				
JR1015	1-216-295-91	SHORT		L1315	1-414-267-11	INDUCTOR	10μH				
JR1016	1-216-295-91	SHORT		<b>TRANSISTOR</b>							
JR1017	1-216-295-91	SHORT		Q1001	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX					
JR1018	1-216-295-91	SHORT		Q1002	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX					
				Q1003	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX					
				Q1009	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX					
				Q1010	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX					
						(ALL EXCEPT KV-20FS12/21FE12/C)					

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<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>			<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>		
Q1010	8-729-120-28	TRANSISTOR 2SC2412K-T-146-QR (KV-20FS12/21FE12/C ONLY)				R1034	1-216-043-91	RES-CHIP	560	5%	1/10W
Q1011	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1035	1-216-049-91	RES-CHIP	1K	5%	1/10W
Q1301	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1036	1-216-033-00	RES-CHIP	220	5%	1/10W
Q1302	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1037	1-216-033-00	RES-CHIP	220	5%	1/10W
Q1306	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1038	1-216-025-91	RES-CHIP	100	5%	1/10W
Q1307	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1040	1-216-033-00	RES-CHIP	220	5%	1/10W
Q1308	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1041	1-216-073-00	RES-CHIP	10K	5%	1/10W
Q1310	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1042	1-249-413-11	CARBON	470	5%	1/4W (ALL EXCEPT KV-21FM12/21FE12A)
Q1311	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1042	1-249-414-11	CARBON	560	5%	1/4W (KV-21FM12 ONLY)
Q1312	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1043	1-216-071-00	RES-CHIP	8.2K	5%	1/10W
Q1313	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1044	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
Q1315	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1045	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
Q1316	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1046	1-249-425-11	CARBON	4.7K	5%	1/4W
Q1317	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1047	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
Q1325	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1048	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
Q1326	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1049	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
Q1327	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1050	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
Q1328	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1052	1-216-033-00	RES-CHIP	220	5%	1/10W
Q1329	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1053	1-216-033-00	RES-CHIP	220	5%	1/10W
Q1330	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1054	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
Q1331	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1055	1-216-049-91	RES-CHIP	1K	5%	1/10W
Q1332	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1056	1-216-081-00	RES-CHIP	22K	5%	1/10W
Q1336	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX				R1057	1-216-049-91	RES-CHIP	1K	5%	1/10W
Q1350	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1058	1-216-635-11	METAL CHIP	220	1%	1/10W
Q1354	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX				R1059	1-247-815-91	CARBON	220	5%	1/4W
<b>RESISTOR</b>						R1060	1-216-635-11	METAL CHIP	220	1%	1/10W
R556	1-216-295-91	SHORT				R1061	1-247-815-91	CARBON	220	5%	1/4W
R1001	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1062	1-216-073-00	RES-CHIP	10K	5%	1/10W
R1016	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1063	1-216-033-00	RES-CHIP	220	5%	1/10W
R1017	1-216-025-91	RES-CHIP	100	5%	1/10W	R1064	1-216-025-91	RES-CHIP	100	5%	1/10W
R1018	1-249-429-11	CARBON	10K	5%	1/4W	R1065	1-216-033-00	RES-CHIP	220	5%	1/10W
R1019	1-216-045-00	RES-CHIP	680	5%	1/10W	R1066	1-216-033-00	RES-CHIP	220	5%	1/10W
R1020	1-216-097-91	RES-CHIP	100K	5%	1/10W	R1067	1-216-033-00	RES-CHIP	220	5%	1/10W
R1021	1-216-121-91	RES-CHIP	1M	5%	1/10W	R1068	1-216-025-91	RES-CHIP	100	5%	1/10W
R1022	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1069	1-216-033-00	RES-CHIP	220	5%	1/10W
R1023	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1070	1-216-033-00	RES-CHIP	220	5%	1/10W
R1024	1-216-033-00	RES-CHIP	220	5%	1/10W	R1071	1-208-806-11	METAL CHIP	10K	1%	1/10W
R1025	1-208-814-91	METAL CHIP	22K	1%	1/10W	R1072	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R1026	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1073	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R1027	1-216-041-00	RES-CHIP	470	5%	1/10W	R1074	1-216-355-11	METAL OXIDE	3.3	5%	1W
R1028	1-216-045-00	RES-CHIP	680	5%	1/10W	R1075	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R1029	1-216-113-00	RES-CHIP	470K	5%	1/10W	R1076	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R1030	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1077	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R1031	1-216-041-00	RES-CHIP	470	5%	1/10W	R1078	1-216-049-91	RES-CHIP	1K	5%	1/10W
R1032	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1079	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R1033	1-216-081-00	RES-CHIP	22K	5%	1/10W	R1080	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
						R1081	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
						R1082	1-216-065-91	RES-CHIP	4.7K	5%	1/10W



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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
R1084	1-216-045-00	RES-CHIP	680	5%	1/10W	R1334	1-216-025-91	RES-CHIP	100	5%	1/10W
R1085	1-216-045-00	RES-CHIP	680	5%	1/10W	R1335	1-216-025-91	RES-CHIP	100	5%	1/10W
R1086	1-216-045-00	RES-CHIP	680	5%	1/10W	R1336	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R1087	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	R1338	1-216-091-00	RES-CHIP	56K	5%	1/10W
R1088	1-216-295-91	SHORT				R1342	1-216-025-91	RES-CHIP	100	5%	1/10W
R1090	1-216-033-00	RES-CHIP	220	5%	1/10W	R1344	1-216-025-91	RES-CHIP	100	5%	1/10W
R1095	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	R1345	1-216-049-91	RES-CHIP	1K	5%	1/10W
(ALL EXCEPT KV-20FV12/21FV12/C)						R1346	1-216-033-00	RES-CHIP	220	5%	1/10W
R1098	1-216-033-00	RES-CHIP	220	5%	1/10W	R1347	1-216-025-91	RES-CHIP	100	5%	1/10W
R1099	1-208-798-11	METAL CHIP	4.7K	1%	1/10W	R1348	1-216-025-91	RES-CHIP	100	5%	1/10W
R1103	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1349	1-216-295-91	SHORT	0		
R1104	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	(KV-21FE12A ONLY)					
R1105	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1350	1-216-073-00	RES-CHIP	10K	5%	1/10W
R1106	1-216-085-00	RES-CHIP	33K	5%	1/10W	R1351	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
(KV-20FS12/21FE12/A/C ONLY)						R1352	1-216-049-91	RES-CHIP	1K	5%	1/10W
R1108	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1355	1-216-025-91	RES-CHIP	100	5%	1/10W
R1109	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1356	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R1110	1-216-059-00	RES-CHIP	2.7K	5%	1/10W	R1357	1-216-043-91	RES-CHIP	560	5%	1/10W
R1111	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1358	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1300	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1359	1-216-025-91	RES-CHIP	100	5%	1/10W
R1301	1-216-053-00	RES-CHIP	1.5K	5%	1/10W	R1360	1-216-041-00	RES-CHIP	470	5%	1/10W
R1302	1-216-041-00	RES-CHIP	470	5%	1/10W	R1361	1-216-295-91	SHORT			
R1303	1-216-025-91	RES-CHIP	100	5%	1/10W	R1362	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R1304	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1363	1-216-043-91	RES-CHIP	560	5%	1/10W
R1306	1-216-033-00	RES-CHIP	220	5%	1/10W	R1364	1-216-025-91	RES-CHIP	100	5%	1/10W
R1308	1-216-033-00	RES-CHIP	220	5%	1/10W	R1365	1-216-025-91	RES-CHIP	100	5%	1/10W
R1310	1-216-025-91	RES-CHIP	100	5%	1/10W	R1366	1-216-025-91	RES-CHIP	100	5%	1/10W
R1311	1-216-047-91	RES-CHIP	820	5%	1/10W	R1367	1-216-025-91	RES-CHIP	100	5%	1/10W
R1312	1-208-806-11	METAL CHIP	10K	1%	1/10W	R1368	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1313	1-216-033-00	RES-CHIP	220	5%	1/10W	(ALL EXCEPT KV-20FV12/21FV12/C)					
R1314	1-216-022-00	RES-CHIP	75	5%	1/10W	R1369	1-259-884-11	CARBON	4.7M	5%	1/4W
R1315	1-216-053-00	RES-CHIP	1.5K	5%	1/10W	R1371	1-216-295-91	SHORT	0		
R1316	1-216-295-91	SHORT				(KV-21FE12A ONLY)					
R1317	1-216-022-00	RES-CHIP	75	5%	1/10W	R1372	1-216-295-91	SHORT			
(KV-20FV12/21FV12/C ONLY)						R1373	1-216-295-91	SHORT	0		
R1318	1-216-022-00	RES-CHIP	75	5%	1/10W	(KV-21FE12A ONLY)					
R1319	1-216-022-00	RES-CHIP	75	5%	1/10W	R1374	1-216-049-91	RES-CHIP	1K	5%	1/10W
R1320	1-216-025-91	RES-CHIP	100	5%	1/10W	R1375	1-216-295-91	SHORT			
R1322	1-216-081-00	RES-CHIP	22K	5%	1/10W	R1376	1-216-295-91	SHORT			
R1323	1-216-025-91	RES-CHIP	100	5%	1/10W	R1378	1-216-295-91	SHORT			
R1325	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	R1379	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1326	1-216-043-91	RES-CHIP	560	5%	1/10W	R1380	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1327	1-216-025-91	RES-CHIP	100	5%	1/10W	R1381	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1328	1-216-067-00	RES-CHIP	5.6K	5%	1/10W	R1382	1-216-097-91	RES-CHIP	100K	5%	1/10W
R1329	1-216-091-00	RES-CHIP	56K	5%	1/10W	R1383	1-216-097-91	RES-CHIP	100K	5%	1/10W
R1330	1-216-081-00	RES-CHIP	22K	5%	1/10W	R1384	1-216-097-91	RES-CHIP	100K	5%	1/10W
R1331	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1385	1-216-113-00	RES-CHIP	470K	5%	1/10W
R1332	1-216-043-91	RES-CHIP	560	5%	1/10W	(ALL EXCEPT KV-21FE12A)					
R1333	1-216-033-00	RES-CHIP	220	5%	1/10W	R1386	1-216-073-00	RES-CHIP	10K	5%	1/10W

**Note:**

The components identified by shading and mark  are critical for safety. Replace only with part number specified.

**Note:**

Les composants identifiés par un trame et une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.




REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
R1387	1-216-095-00	RES-CHIP	82K	5%	1/10W						
R1387	1-216-085-00	RES-CHIP	33K	5%	1/10W						
		(KV-21FE12A ONLY)									
R1388	1-216-129-00	RES-CHIP	2.2M	5%	1/10W						
R1389	1-216-071-00	RES-CHIP	8.2K	5%	1/10W						
R1389	1-216-077-91	RES-CHIP	15K	5%	1/10W						
		(KV-21FE12A ONLY)									
R1390	1-216-025-91	RES-CHIP	100	5%	1/10W						
R1391	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1392	1-216-295-91	SHORT									
R1393	1-216-069-00	RES-CHIP	6.8K	5%	1/10W						
R1394	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1395	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1396	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1397	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1398	1-216-049-91	RES-CHIP	1K	5%	1/10W						
R1399	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1400	1-216-295-91	SHORT									
R1401	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1402	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R1403	1-216-049-91	RES-CHIP	1K	5%	1/10W						
R1404	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1406	1-216-049-91	RES-CHIP	1K	5%	1/10W						
R1407	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R1409	1-216-043-91	RES-CHIP	560	5%	1/10W						
R1410	1-216-295-91	SHORT									
		(ALL EXCEPT KV-21FE12A)									
R1411	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1412	1-216-635-11	METAL CHIP	220	1%	1/10W						
R1413	1-216-091-00	RES-CHIP	56K	5%	1/10W						
R1414	1-216-049-91	RES-CHIP	1K	5%	1/10W						
R1415	1-216-049-91	RES-CHIP	1K	5%	1/10W						
R1416	1-216-057-00	RES-CHIP	2.2K	5%	1/10W						
R1417	1-216-035-00	RES-CHIP	270	5%	1/10W						
R1418	1-216-045-00	RES-CHIP	680	5%	1/10W						
R1419	1-216-295-91	SHORT									
R1442	1-216-103-00	RES-CHIP	180K	5%	1/10W						
R1442	1-216-107-00	RES-CHIP	270K	5%	1/10W						
		(KV-21FE12A ONLY)									
<b>CRYSTAL</b>											
X1001	1-767-487-11	VIBRATOR, CRYSTAL									
X1303	1-579-973-11	VIBRATOR, CRYSTAL									
		(KV-21FE12A ONLY)									
X1304	1-567-505-11	VIBRATOR, CRYSTAL									
X1305	1-579-972-11	VIBRATOR, CRYSTAL									
		(KV-21FE12A ONLY)									
<b>RESISTOR</b>											
R901	1-249-401-11	CARBON	47	5%	1/4W						
R902	1-249-386-11	CARBON	2.7	5%	1/4W						
R903	1-249-414-11	CARBON	560	5%	1/4W						
R904	1-249-432-11	CARBON	18K	5%	1/4W						
R905	1-249-417-11	CARBON	1K	5%	1/4W						
R906	1-249-432-11	CARBON	18K	5%	1/4W						
R907	1-249-386-11	CARBON	2.7	5%	1/4W						

**Note:**

The components identified by shading and mark are critical for safety. Replace only with part number specified.

**Note:**

Les composants identifiés par un trame et une marque sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>			<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>
R908	1-249-414-11	CARBON	560	5%	1/4W		4-075-501-41	MANUAL, INSTRUCTION (KV-21FV12/C ONLY)	
R909	1-260-312-11	CARBON	47	5%	1/2W		1-417-182-11	CONVERTER (EAC-25) (ALL EXCEPT KV-20FS12/20FV12)	
R910	1-216-476-11	METAL OXIDE	180	5%	3W				
R911	1-249-403-11	CARBON	68	5%	1/4W				
R912	1-247-815-91	CARBON	220	5%	1/4W				
R913	1-249-403-11	CARBON	68	5%	1/4W				
R914	1-249-410-11	CARBON	270	5%	1/4W				
R915	1-249-417-11	CARBON	1K	5%	1/4W				
R916	1-249-417-11	CARBON	1K	5%	1/4W				
R917	1-249-417-11	CARBON	1K	5%	1/4W				
R918	1-247-807-31	CARBON	100	5%	1/4W				
R919	1-247-807-31	CARBON	100	5%	1/4W				
R920	1-249-416-11	CARBON	820	5%	1/4W				
R921	1-249-429-11	CARBON	10K	5%	1/4W				
R922	1-249-397-11	CARBON	22	5%	1/4W				
R923	1-249-401-11	CARBON	47	5%	1/4W				

**REMOTE COMMANDER****ACCESSORIES AND PACKAGING**

- 1-501-730-41 ANTENNA, TELESCOPIC  
(ALL EXCEPT KV-20FS12/20FV12)
- \* 4-073-838-01 BAG, PROTECTION
- 4-073-495-01 CARTON, INDIVIDUAL  
(KV-20FS12 ONLY)
- \* 4-070-554-02 CARTON, INDIVIDUAL  
(KV-20FV12 ONLY)
- \* 4-073-479-01 CARTON, INDIVIDUAL  
(KV-21FM12/21FE12/A/C ONLY)
- \* 4-073-839-01 CARTON, INDIVIDUAL  
(KV-21FV12/C ONLY)
- 4-073-494-01 CUSHION ASSY, LOWER  
(KV-20FS12 ONLY)
- \* 4-070-563-01 CUSHION ASSY, LOWER  
(KV-20FV12/21FV12/C ONLY)
- \* 4-073-477-01 CUSHION ASSY, LOWER  
(KV-21FM12/21FE12/A/C ONLY)
- 4-073-493-01 CUSHION ASSY, UPPER  
(KV-20FS12 ONLY)
- \* 4-070-562-01 CUSHION ASSY, UPPER  
(KV-20FV12/21FV12/C ONLY)
- \* 4-073-478-01 CUSHION ASSY, UPPER  
(KV-21FM12/21FE12/A/C ONLY)
- 4-075-509-31 MANUAL, INSTRUCTION  
(KV-20FS12 ONLY)
- 4-075-501-31 MANUAL, INSTRUCTION  
(KV-20FV12 ONLY)
- 4-075-509-41 MANUAL, INSTRUCTION  
(KV-21FM12/21FE12/A/C ONLY)



**Sony Corporation**  
**Sony Technology Center**  
**Product Quality Division**  
**Service Promotion Dept.**

9-965-879-01

English  
2000AS74350-1  
Printed in USA  
2000.2

# SERVICE MANUAL

# BA-5 CHASSIS

<u>MODEL</u>	<u>DEST</u>	<u>COMMANDER</u>	<u>CHASSIS NO.</u>
<b>KV-20FS12</b>	RM-Y173	US	SCC-S40A-A
<b>KV-20FS12</b>	RM-Y173	CND	SCC-S41A-A
<b>KV-20FV12</b>	RM-Y168	US	SCC-S40B-A
<b>KV-20FV12</b>	RM-Y168	CND	SCC-S41B-A
<b>KV-21FE12</b>	RM-Y173	E	SCC-S38A-A
<b>KV-21FE12A</b>	RM-Y173	E	SCC-S38F-A
<b>KV-21FE12C</b>	RM-Y173	E	SCC-S38B-A
<b>KV-21FM12</b>	RM-Y172	MX	SCC-S39A-A
<b>KV-21FV12</b>	RM-Y168	E	SCC-S38C-A
<b>KV-21FV12C</b>	RM-Y168	E	SCC-S38D-A

## CORRECTION- 1

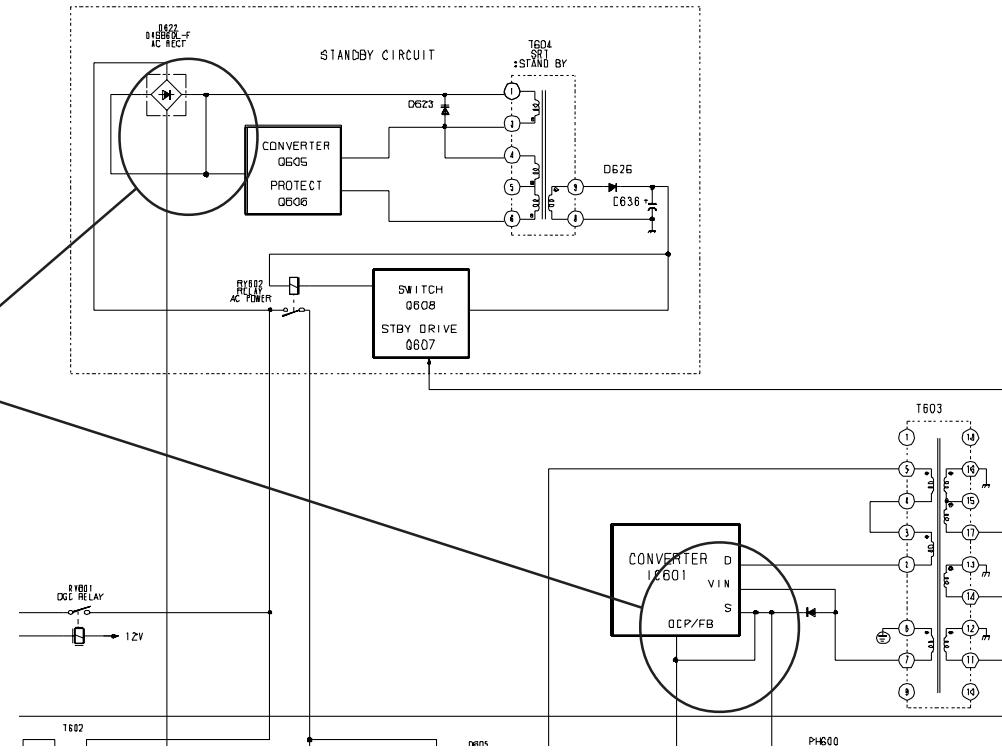
SUBJECT: BLOCK DIAGRAM, A BOARD VOLTAGE TABLE,  
PARTS LIST (All Variant Parts Identified)

Correct the service manual as shown.  
File this Correction with the service manual.

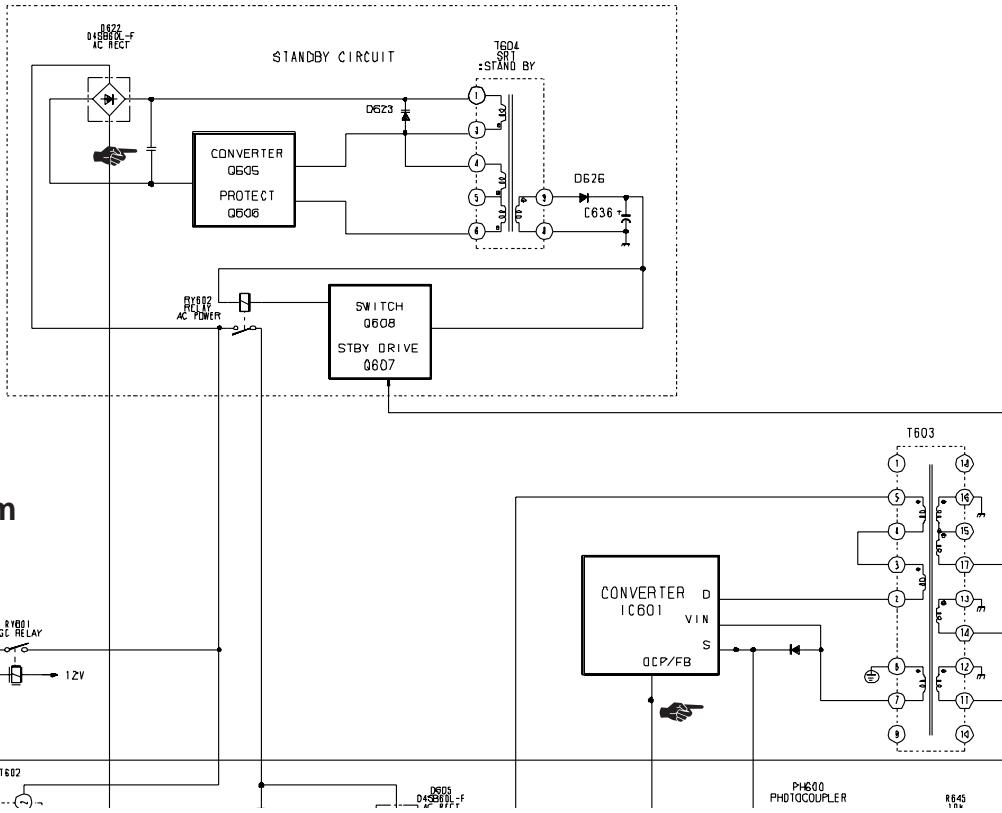
**TRINITRON® COLOR TV**  
**SONY®**

## SECTION 6-1. BLOCK DIAGRAM (Page 27)

**INCORRECT**



## CORRECT



## SECTION 6 A BOARD IC VOLTAGE TABLES (Page 37)

☛: Corrected item

### A BOARD IC VOLTAGE LIST

IC401		11	4.1	IC501		IC602	
pin	volt	12	4.1	pin	volt	pin	volt
1	0.6	13	5.2	1	0.2	1	135.9
2	0.0	14	6.8	2	3.7	2	123.4
3	2.4	15	14.1	3	2.5	3	GND
4	14.3	16	GND	4	GND	IC603	
5	2.4	17	6.8	5	9.5	pin	volt
6	0.0	IC405		6	10.1	1	13.3
7	0.6	pin	volt	7	0.1	2	8.9
8	6.9	1	6.0	8	14.0	3	GND
9	0.0	2	0.1	IC502		4	13.3
10	6.9	3	6.1	pin	volt	IC604	
11	6.9	4	0.1	1	2.1	pin	volt
12	0.0	5	6.1	2	14.0	1	13.3
13	6.9	6	9.0	3	-12.6	2	5.0
IC 402		7	5.3	4	-13.9	3	GND
pin	volt	8	GND	5	0.2	IC2001	
1	6.8	IC406		6	14.3	pin	volt
2	GND	pin	volt	7	2.1	1	5.0
3	14.1	1	6.0	IC601		2	5.0
4	6.8	2	0.1	pin	volt	3	GND
5	4.3	3	6.1	1	-31.8		
6	NC	4	0.1	2	-32.7		
7	4.1	5	6.1	3	53.2		
8	4.1	6	9.0	4	-23.8		
9	6.8	7	5.3	5	-32.7		
10	4.1	8	GND				

TU101		14	N/C
pin	volt	15	N/C
1	8.6	16	N/C
2	30.7	17	4.7
3	5.1	18	4.4
4	4.9	19	5.0
5	4.9	20	5.0
6	GND	21	0.3
7	5.5	22	0.0
8	2.1	23	0.0
9	8.9	24	0.0
10	4.1	25	0.0
11	GND	26	4.5
12	N/C	27	4.5
13	N/C	All voltages are in V	

## SECTION 8

### ELECTRICAL PARTS LIST

**Note:**

The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

**A**
**Note:**

Les composants identifiés par un trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- The components identified by  $\blacksquare$  in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding X-ray radiation. Should replacement be required, replace only with the value originally used.

- Items marked \* are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

**RESISTORS**

- All resistors are in ohms
- F : nonflammable

When indicating parts by reference number, please include the board name.

REF. NO.	PART NO.	DESCRIPTION	REMARK	REF. NO.	PART NO.	DESCRIPTION	REMARK
<b>A</b>				C214	1-164-346-11	CERAMIC CHIP	1 $\mu$ F 16V
				C215	1-164-346-11	CERAMIC CHIP	1 $\mu$ F 16V (ALL EXCEPT KV-21FM12)
				C216	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V
				C219	1-126-964-11	ELECT	10 $\mu$ F 20% 50V
				C401	1-126-968-11	ELECT	100 $\mu$ F 20% 50V (KV-21FV12/C ONLY)
				C402	1-126-943-11	ELECT	2200 $\mu$ F 20% 25V
				C403	1-126-957-11	ELECT	0.22 $\mu$ F 20% 50V
				C420	1-164-222-11	CERAMIC CHIP	0.22 $\mu$ F 25V
				C421	1-164-222-11	CERAMIC CHIP	0.22 $\mu$ F 25V (ALL EXCEPT KV-21FM12)
				C435	1-164-222-11	CERAMIC CHIP	0.22UF 25V (KV-21FV12/C ONLY)
				C438	1-126-940-11	ELECT	330 $\mu$ F 20% 25V
				C439	1-126-940-11	ELECT	330 $\mu$ F 20% 25V
				C440	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V (ALL EXCEPT KV-20FV12/21FV12/C)
				C441	1-164-346-11	CERAMIC CHIP	1 $\mu$ F 16V
				C442	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V
				C443	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F 10% 50V (ALL EXCEPT KV-20FV12/21FV12/C)
				C444	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F 10% 50V (ALL EXCEPT KV-20FV12/21FV12/C)
				C445	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F 10% 50V (ALL EXCEPT KV-20FV12/21FV12/C)
				C446	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F 10% 50V (KV-20FS12/21FE12/A/C ONLY)
C100	1-164-346-11	CERAMIC CHIP	1 $\mu$ F 16V	C450	1-165-320-11	CERAMIC CHIP	0.47 $\mu$ F 10% 16V
C101	1-164-346-11	CERAMIC CHIP	1 $\mu$ F 16V	C501	1-102-112-00	CERAMIC	330PF 10% 50V
C102	1-126-933-11	ELECT	100 $\mu$ F 20% 16V	C502	1-106-383-00	MYLAR	0.047 $\mu$ F 10% 200V
C104	1-126-941-11	ELECT	470 $\mu$ F 20% 25V	C503	1-102-212-00	CERAMIC	820PF 10% 500V
C105	1-104-664-11	ELECT	47 $\mu$ F 20% 25V	C504	1-102-002-00	CERAMIC	680PF 10% 500V
C204	1-163-017-00	CERAMIC CHIP	0.0047 $\mu$ F 10% 50V	C505	$\triangle$ 1-162-134-11	CERAMIC	470PF 10% 2KV
C205	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V	C506	1-162-318-11	CERAMIC	0.001 $\mu$ F 10% 500V
C207	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V (KV-20FS12/21FM12/21FE12A ONLY)	C507	$\triangle$ 1-117-642-11	FILM	8200PF 3% 1.2KV
C208	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V (ALL EXCEPT KV-20FV12/21FV12/C)	C508	1-137-150-11	MYLAR	0.01 $\mu$ F 10% 100V
C210	1-126-963-11	ELECT	4.7 $\mu$ F 20% 50V (ALL EXCEPT KV-21FM12)	C509	$\triangle$ 1-162-116-00	CERAMIC	680PF 10% 2KV
				C510	1-107-651-11	ELECT	4.7 $\mu$ F 20% 250V
				C511	$\triangle$ 1-115-519-11	FILM	0.56 $\mu$ F 5% 250V

## Note:

The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

## Note:

Les composants identifiés par un trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

A

REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
C512	$\triangle$ 1-106-383-00	MYLAR	0.047 $\mu$ F	10%	200V	C621	1-117-214-11	CERAMIC	0.001 $\mu$ F	10%	2KV
C513	1-106-343-00	MYLAR	0.001 $\mu$ F	10%	100V	C622	1-164-625-11	CERAMIC	680PF	10%	500V
C514	$\triangle$ 1-115-521-11	FILM	0.82 $\mu$ F	5%	250V	C623	1-164-625-11	CERAMIC	680PF	10%	500V
C515	$\triangle$ 1-162-116-00	CERAMIC	680PF	10%	2KV	C624	1-131-867-51	ELECT	100 $\mu$ F		160V
C516	1-117-214-11	CERAMIC	0.001 $\mu$ F	10%	2KV	C625	1-135-412-51	ELECT	1000 $\mu$ F	20%	25V
C520	$\triangle$ 1-129-722-00	FILM	0.047 $\mu$ F	5%	630V	C625	1-135-573-51	ELECT	15000 $\mu$ F	20%	25V
C521	1-164-646-11	CERAMIC	2200PF	10%	500V	(KV-21FV12/C ONLY)					
C523	1-126-941-11	ELECT	470 $\mu$ F	20%	25V	C626	1-135-412-51	ELECT	1000 $\mu$ F	20%	25V
C524	1-102-244-00	CERAMIC	220PF	10%	500V	C627	1-136-189-00	MYLAR	0.1 $\mu$ F	10%	250V
C525	1-162-815-11	CERAMIC	47PF	5%	500V	C628	1-104-665-11	ELECT	100 $\mu$ F	20%	25V
C526	1-126-960-11	ELECT	1 $\mu$ F	20%	50V	C630	1-113-924-11	CERAMIC	0.0047 $\mu$ F	20%	250V
C527	1-126-965-11	ELECT	22 $\mu$ F	20%	50V	(KV-20FS12/20FV12 ONLY)					
C528	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%	50V	C631	1-113-924-11	CERAMIC	0.0047 $\mu$ F	20%	250V
C529	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%	50V	(KV-20FS12/20FV12 ONLY)					
C530	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C634	1-137-605-11	MYLAR	0.01 $\mu$ F	10%	250V
C531	1-106-387-00	MYLAR	0.068 $\mu$ F	10%	200V	C635	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V
C533	1-126-941-11	ELECT	470 $\mu$ F	20%	25V	C636	1-126-970-11	ELECT	330 $\mu$ F	20%	50V
C534	$\triangle$ 1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C637	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V
C535	1-126-959-11	ELECT	0.47 $\mu$ F	20%	50V	C638	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C537	$\triangle$ 1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	C639	1-126-965-11	ELECT	22 $\mu$ F	20%	50V
C539	1-107-645-11	ELECT	22 $\mu$ F	20%	160V	C641	1-107-679-91	ELECT	10 $\mu$ F	20%	450V
C540	1-107-645-11	ELECT	22 $\mu$ F	20%	160V	C643	1-104-760-11	CERAMIC CHIP	0.047 $\mu$ F	10%	50V
C541	1-126-969-11	ELECT	220 $\mu$ F	20%	50V	C644	1-161-964-91	CERAMIC	0.0047 $\mu$ F		250V
C542	1-126-967-11	ELECT	47 $\mu$ F	20%	50V	C645	1-161-964-91	CERAMIC	0.0047 $\mu$ F		250V
C543	1-137-194-81	MYLAR	0.47 $\mu$ F	5%	50V	C646	1-161-964-91	CERAMIC	0.0047 $\mu$ F		250V
C546	$\triangle$ 1-107-635-11	ELECT	4.7 $\mu$ F	20%	160V	C647	1-161-964-91	CERAMIC	0.0047 $\mu$ F		250V
C547	$\triangle$ 1-163-031-11	CERAMIC CHIP	0.01 $\mu$ F		50V	C648	1-136-346-51	MYLAR	0.22 $\mu$ F	20%	125V
C548	1-123-024-21	ELECT	33 $\mu$ F		160V	(KV-20FS12/20FV12 ONLY)					
C549	$\triangle$ 1-126-934-11	ELECT	220 $\mu$ F	20%	16V	C648	1-136-346-61	MYLAR	0.22 $\mu$ F	20%	300V
C551	$\triangle$ 1-137-417-11	MYLAR	0.0047 $\mu$ F	10%	200V	C652	1-130-471-00	MYLAR	0.001 $\mu$ F	5%	50V
C553	1-107-662-11	ELECT	22 $\mu$ F	20%	250V	C654	1-107-636-11	ELECT	10 $\mu$ F	20%	160V
C557	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F		25V	C655	$\triangle$ 1-136-311-51	MYLAR	0.47 $\mu$ F	20%	125V
C601	1-164-004-11	CERAMIC CHIP	0.1 $\mu$ F	10%	25V	(KV-20FS12/20FV12 ONLY)					
C602	1-126-967-11	ELECT	47 $\mu$ F	20%	50V	C655	$\triangle$ 1-136-311-61	MYLAR	0.47 $\mu$ F	20%	300V
C604	1-164-182-11	CERAMIC CHIP	0.0033 $\mu$ F	10%	50V	(ALL EXCEPT KV-20FS12/20FV12)					
C606	$\triangle$ 1-113-923-11	CERAMIC	0.0033 $\mu$ F	20%	250V	C657	1-104-664-11	ELECT	47 $\mu$ F	20%	25V
C607	1-136-311-51	MYLAR	0.47 $\mu$ F	20%	125V	C658	1-135-412-51	ELECT	1000 $\mu$ F	20%	25V
			(KV-20FS12/20FV12 ONLY)								
C607	1-136-311-61	MYLAR	0.47 $\mu$ F	20%	300V	C658	1-135-573-51	ELECT	15000 $\mu$ F	20%	25V
			(ALL EXCEPT KV-20FS12/20FV12)								
C611	$\triangle$ 1-113-923-11	CERAMIC	0.0033 $\mu$ F	20%	250V	C699	1-117-703-11	CERAMIC	0.0047 $\mu$ F	20%	250V
C612	$\triangle$ 1-117-893-11	ELECT	470 $\mu$ F	20%	250V	C2001	1-104-664-11	ELECT	47 $\mu$ F	20%	25V
			(KV-20FS12/20FV12 ONLY)								
C612	$\triangle$ 1-128-714-11	ELECT	330 $\mu$ F	20%	400V	(KV-20FS12/20FV12 ONLY)					
C617	1-125-893-11	FILM	680PF	3%	1.5KV	CONNECTOR					
C618	1-164-081-11	CERAMIC	470PF	10%	50V	CN403	*	1-564-505-11	PLUG, CONNECTOR 2P		
			(ALL EXCEPT KV-20FV12/21FV12/C)								
C619	1-136-356-11	MYLAR	470PF	5%	50V	CN404	*	1-564-505-11	PLUG, CONNECTOR 2P		
C620	1-104-665-11	ELECT	100 $\mu$ F	20%	25V	(ALL EXCEPT KV-20FV12/21FV12/C)					

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<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>	<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>				
CN406 *	1-564-507-11	PLUG, CONNECTOR 4P		D610	8-719-510-02	DIODE D1NS4-TA					
CN460	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P (KV-20FV12/21FV12/C ONLY)		D611	8-719-063-70	DIODE D1NL20U-TA					
CN501 *	1-580-798-11	CONNECTOR PIN (DY) 6P		D612	8-719-110-17	DIODE MTZJ-T-77-10B					
CN502 *	1-564-509-11	PLUG, CONNECTOR 6P		D613	8-719-063-70	DIODE D1NL20U-TA					
CN506 *	1-564-508-11	PLUG, CONNECTOR 5P		D614	8-719-063-70	DIODE D1NL20U-TA					
CN601 *	1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P		D615	8-719-312-10	DIODE RU4AM-T3					
CN602 * <b>△</b>	1-580-843-11	PIN, CONNECTOR (POWER)		D616	8-719-510-37	DIODE D5LC20U					
CN2001*	1-564-511-11	PLUG, CONNECTOR 8P		D617	8-719-110-31	DIODE MTZJ-T-77-12C					
CN2002	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P		D618	8-719-991-33	DIODE 1SS133T-77					
CN2009	1-573-298-21	CONNECTOR, BOARD TO BOARD 20P		D619	8-719-110-17	DIODE MTZJ-T-77-10B					
<b>DIODE</b>											
D204	8-719-982-22	DIODE MTZJ-T-77-30D		D620	8-719-510-37	DIODE D5LC20U					
D208	8-719-110-17	DIODE MTZJ-T-77-10B		<b>△</b> D622	8-719-077-76	DIODE D2SB60A-F04					
D209	8-719-110-17	DIODE MTZJ-T-77-10B		D623	8-719-948-45	DIODE ERA22-08TP3					
D210	8-719-110-17	DIODE MTZJ-T-77-10B		D624	8-719-991-33	DIODE 1SS133T-77					
D212	8-719-110-17	DIODE MTZJ-T-77-10B		D625	8-719-991-33	DIODE 1SS133T-77					
D213	8-719-110-17	DIODE MTZJ-T-77-10B		D626	8-719-063-70	DIODE D1NL20U-TA					
D230	8-719-108-12	DIODE RD9.1EW-T1 (KV-20FV12/21FV12/C ONLY)		D627	8-719-110-03	DIODE MTZJ-T-77-7.5A					
D231	8-719-108-12	DIODE RD9.1EW-T1 (KV-20FV12/21FV12/C ONLY)		D628	8-719-510-48	DIODE D1N20R-TA					
D400	8-719-108-12	DIODE RD9.1EW-T1		D2001	8-719-070-80	DIODE LNK0120022G (KV-20FS12/21FM12/21FE12/C ONLY)					
D401	8-719-110-08	DIODE MTZJ-T-77-8.2B		D2001	8-719-074-84	DIODE LNK0120022G1 (KV-20FV12/21FV12/C ONLY)					
D403	8-719-073-01	DIODE MA111-TX (ALL EXCEPT KV-20FV12/21FV12/C)		D2001	8-719-078-12	DIODE LNK0220022G2 (KV-21FE12A ONLY)					
D502	8-719-908-03	DIODE GP08DPKG23		D2002	8-719-110-17	DIODE MTZJ-T-77-10B					
D503	8-719-908-03	DIODE GP08DPKG23		D2003	8-719-108-12	DIODE RD9.1EW-T1					
<b>△</b> D504	8-719-945-80	DIODE ERC06-15S		D2004	8-719-921-44	DIODE MTZJ-T-77-5.1C					
<b>△</b> D505	8-719-979-85	DIODE RGP15GPKG23		D2005	8-719-921-44	DIODE MTZJ-T-77-5.1C					
D506	8-719-302-43	DIODE RGP10GPKG3		<b>FUSE</b>							
<b>△</b> D507	8-719-991-33	DIODE 1SS133T-77		F601	<b>△</b> 1-576-193-11	FUSE 6.3A/125V (KV-20FS12/20FV12 ONLY)					
D508	8-719-991-33	DIODE 1SS133T-77		F601	<b>△</b> 1-532-506-51	FUSE 6.3A/250V (ALL EXCEPT KV-20FS12/20FV12)					
D509	8-719-921-44	DIODE MTZJ-T-77-5.1C		<b>FERRITE BEAD</b>							
D510	8-719-908-03	DIODE GP08DPKG23		FB501	1-410-397-21	FERRITE	1.1µH				
D511	8-719-302-43	DIODE RGP10GPKG23		FB502	1-410-397-21	FERRITE	1.1µH				
D513	8-719-979-85	DIODE RGP15GPKG23		FB503	1-410-397-21	FERRITE	1.1µH				
D514	8-719-979-85	DIODE RGP15GPKG23		FB600	1-412-911-11	FERRITE	0µH				
<b>△</b> D516	8-719-991-33	DIODE 1SS133T-77		FB601	1-412-911-11	FERRITE	0µH				
<b>△</b> D517	8-719-991-33	DIODE 1SS133T-77		FB602	1-412-911-11	FERRITE	0µH				
D518	<b>△</b> 8-719-110-08	DIODE RD8.2ES-T1B		FB603	1-412-911-11	FERRITE	0µH				
D519	<b>△</b> 8-719-302-43	DIODE EL1Z-V1		FB604	1-412-911-11	FERRITE	0µH				
D520	<b>△</b> 8-719-073-01	DIODE MA111-TX		FB605	1-412-911-11	FERRITE	0µH				
D601	8-719-991-33	DIODE 1SS133T-77		FB606	1-412-911-11	FERRITE	0µH				
D602	8-719-991-33	DIODE 1SS133T-77		FB609	1-412-911-11	FERRITE	0µH				
D605	<b>△</b> 8-719-510-53	DIODE D4SB60L-F		FB610	1-412-911-11	FERRITE	0µH				

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REF.NO.	PART NO.	DESCRIPTION	REMARK	REF.NO.	PART NO.	DESCRIPTION	REMARK
<b><u>IC</u></b>							
IC401	8-759-490-17	IC TDA7057AQ/N2 (ALL EXCEPT KV-21FV12/C)		L101	1-414-267-11	INDUCTOR	10µH
IC402	8-759-573-40	IC TDA8580Q/N1 (KV-21FV12/C ONLY)		L102	1-414-273-11	INDUCTOR	100µH
IC405	8-759-450-93	IC NJM2521M-TE1 (ALL EXCEPT KV-20FV12/21FV12/C)		L103	1-414-267-11	INDUCTOR	10µH
IC406	8-759-450-93	IC NJM2521M-TE1 (KV-20FS12/21FE12/A/C ONLY)		L501	△ 1-409-955-11	INDUCTOR	8mH
IC501	△ 8-759-700-07	IC NJM2903M-TE2		L502	1-412-552-11	INDUCTOR	2.2mH
IC502	8-759-980-58	IC TDA8172		L503	1-406-677-11	INDUCTOR	10mH
IC601	△ 8-749-015-60	IC STR-F6624 (KV-20FS12/20FV12 ONLY)		L504	1-412-533-21	INDUCTOR	47µH
IC601	△ 8-749-013-75	IC STR-F6654 (ALL EXCEPT KV-20FS12/20FV12)		L508	△ 1-406-981-21	INDUCTOR	470µH
IC602	△ 8-749-016-47	IC EA135-F12		L510	△ 1-412-528-11	INDUCTOR	18µH
IC603	8-759-198-03	IC PQ09RF21		L603	1-412-529-11	INDUCTOR	22µH
IC604	8-759-701-75	IC NJM7805FA		L604	1-412-525-31	INDUCTOR	10µH
IC2001	8-742-134-00	HYB IC SBX1981-51P		L605	1-412-529-11	INDUCTOR	22µH
<b><u>PHOTO COUPLER</u></b>							
PH601 △ 8-749-010-64 PHOTO COUPLER PC123FY2							
<b><u>JACK</u></b>							
J201	1-794-118-11	JACK BLOCK, PIN 3P (KV-20FS12/21FE12/A/C ONLY)		<b><u>IC LINK</u></b>			
J201	1-794-119-11	TERMINAL BLOCK, S 4P (KV-20FV12/21FV12/C ONLY)		PS401	△ 1-576-336-21	LINK, IC (ALL EXCEPT KV-21FV12/C)	
J201	1-794-115-11	JACK BLOCK, PIN 2P (KV-21FM12 ONLY)		PS401	△ 1-532-686-21	LINK, IC 2.7A/150V (KV-21FV12/C ONLY)	
J202	1-794-267-11	JACK, PIN 3P (ALL EXCEPT KV-21FM12)		<b><u>TRANSISTOR</u></b>			
J202	1-794-266-21	JACK, PIN 2P (KV-21FM12 ONLY)		Q101	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
J205	1-794-116-11	JACK BLOCK, PIN 2P (KV-20FV12/21FV12/C ONLY)		Q410	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX (KV-21FV12/C ONLY)	
J401	1-568-267-21	JACK		Q411	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
<b><u>CHIP CONDUCTOR</u></b>				Q501	8-729-140-50	TRANSISTOR 2SC3209LK-TP	
JR001	1-216-295-91	SHORT		Q502	△ 8-729-051-69	TRANSISTOR 2SD2624	
JR002	1-216-295-91	SHORT (ALL EXCEPT KV-20FS12/21FE12/A/C)		<b><u>TRANSISTOR</u></b>			
JR202	1-216-295-91	SHORT (KV-20FS12/21FE12/A/C ONLY)		Q503	△ 8-729-422-27	TRANSISTOR 2SD601A-QRS-TX (ALL EXCEPT KV-21FM12)	
JR403	1-216-295-91	SHORT		Q503	△ 8-729-120-28	TRANSISTOR 2SC2412K-T-146-QR (KV-21FM12 ONLY)	
JR405	1-216-295-91	SHORT (KV-21FV12/C ONLY)		Q504	8-729-809-29	TRANSISTOR 2SC4159-E	
JR409	1-216-295-91	SHORT (KV-20FS12/21FE12/A/C ONLY)		Q505	△ 8-729-200-17	TRANSISTOR 2SA10910-TPE2	
JR411	1-216-295-91	SHORT (KV-20FV12/21FV12/C ONLY)		Q506	△ 8-729-422-27	TRANSISTOR 2SD601A-QRS-TX (ALL EXCEPT KV-21FV12/C)	
JR412	1-216-295-91	SHORT (KV-20FS12/21FE12/A/C ONLY)		<b><u>TRANSISTOR</u></b>			
JR430	1-216-295-91	SHORT		Q506	△ 8-729-422-27	TRANSISTOR 2SD601A-QRS-TX (KV-21FV12/C ONLY)	
JR470	1-216-295-91	SHORT (KV-21FM12 ONLY)		Q507	△ 8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
JR471	1-216-295-91	SHORT (KV-21FV12/C ONLY)		Q604	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
JR503	1-216-295-91	SHORT		Q605	△ 8-729-046-40	TRANSISTOR 2SK2663	
JR505	1-216-295-91	SHORT (ALL EXCEPT KV-21FV12/C)		Q606	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
<b><u>COIL</u></b>				Q607	8-729-922-37	TRANSISTOR 2SD2144S-TP-UVW	
<b><u>COIL</u></b>				Q608	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	
<b><u>COIL</u></b>				Q609	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA	

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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK								
<b>RESISTOR</b>																	
R101	1-216-073-00	RES-CHIP	10K	5%	1/10W	R436	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R103	1-216-295-91	SHORT	0	(KV-21FM12 ONLY)		R437	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R105	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R437	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R107	1-216-025-91	RES-CHIP	100	5%	1/10W	(KV-20FV12/21FV12/C ONLY)											
R108	1-216-025-91	RES-CHIP	100	5%	1/10W	R438	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R114	1-216-295-91	SHORT	0	(KV-21FM12 ONLY)		R438	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R115	1-216-295-91	SHORT	0	(EXCEPT KV-21FM12)		R439	1-216-065-91	RES-CHIP	4.7K	5%	1/10W						
R204	1-216-083-00	RES-CHIP	27K	5%	1/10W	R439	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R205	1-216-689-11	RES-CHIP	39K	5%	1/10W	R439	1-216-089-91	RES-CHIP	47K	5%	1/10W						
R206	1-216-295-91	SHORT	0	(KV-21FM12 ONLY)		R440	1-216-097-91	RES-CHIP	100K	5%	1/10W						
R208	1-215-899-11	METAL OXIDE	15K	5%	2W	R441	1-216-081-00	RES-CHIP	22K	5%	1/10W						
R214	1-216-113-00	RES-CHIP	470K	5%	1/10W	R442	1-216-025-91	RES-CHIP	100	5%	1/10W						
(ALL EXCEPT KV-21FM12)																	
R215	1-216-113-00	RES-CHIP	470K	5%	1/10W	R443	1-216-033-00	RES-CHIP	220	5%	1/10W						
R235	1-216-089-91	RES-CHIP	47K	5%	1/10W	R444	1-216-033-00	RES-CHIP	220	5%	1/10W						
R237	1-216-033-00	RES-CHIP	220	5%	1/10W	R445	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R238	1-216-033-00	RES-CHIP	220	5%	1/10W	R446	1-249-435-11	CARBON	33K	5%	1/4W						
R239	1-216-089-91	RES-CHIP	47K	5%	1/10W	R447	1-216-049-91	RES-CHIP	1K	5%	1/10W						
R401	1-216-080-00	RES-CHIP	20K	5%	1/10W	R454	1-216-025-91	RES-CHIP	100	5%	1/10W						
(KV-21FV12/C ONLY)																	
R402	1-216-073-00	RES-CHIP	10K	5%	1/10W	R501	1-247-843-11	CARBON	3.3K	5%	1/4W						
R409	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R502	$\triangle$ 1-215-892-11	METAL OXIDE	1K	5%	2W						
R421	1-249-425-11	CARBON	4.7K	5%	1/4W	R503	$\triangle$ 1-249-426-11	CARBON	5.6K	5%	1/4W						
R422	1-249-389-11	CARBON	4.7	5%	1/4W	R506	$\triangle$ 1-215-886-11	METAL OXIDE	100	5%	2W						
R424	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R507	$\triangle$ 1-260-320-11	CARBON	220	5%	1/2W						
(ALL EXCEPT KV-20FV12/21FV12/C)																	
R425	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R508	1-247-863-91	CARBON	22K	5%	1/4W						
(ALL EXCEPT KV-20FV12/21FM12/21FV12/C)																	
R425	1-216-295-91	SHORT	0	(KV-21FM12 ONLY)		R509	$\triangle$ 1-215-892-11	METAL OXIDE	1K	5%	2W						
R426	1-216-009-91	RES-CHIP	22	5%	1/10W	R510	1-249-411-11	CARBON	330	5%	1/4W						
(KV-21FV12/C ONLY)																	
R427	1-247-815-91	CARBON	220	5%	1/4W	R513	$\triangle$ 1-215-913-11	METAL OXIDE	220	5%	3W						
R428	1-216-033-00	RES-CHIP	220	5%	1/10W	R516	1-249-429-11	CARBON	10K	5%	1/4W						
R429	1-216-113-00	RES-CHIP	470K	5%	1/10W	R517	1-249-425-11	CARBON	4.7K	5%	1/4W						
(KV-20FV12/21FV12/C ONLY)																	
R430	1-216-049-91	RES-CHIP	1K	5%	1/10W	R518	1-249-427-11	CARBON	6.8K	5%	1/4W						
(KV-20FV12/21FV12/C ONLY)																	
R431	1-216-049-91	RES-CHIP	1K	5%	1/10W	R519	1-249-427-11	CARBON	6.8K	5%	1/4W						
(KV-20FV12/21FV12/C ONLY)																	
R432	1-216-073-00	RES-CHIP	10K	5%	1/10W	R520	$\triangle$ 1-215-861-00	METAL OXIDE	47	5%	1W						
(ALL EXCEPT KV-20FV12/21FV12/C)																	
R432	1-216-085-00	RES-CHIP	33K	5%	1/10W	R521	1-249-411-11	CARBON	330	5%	1/4W						
(KV-20FV12/21FV12/C ONLY)																	
R433	1-216-113-00	RES-CHIP	470K	5%	1/10W	R522	1-249-415-11	CARBON	680	5%	1/4W						
(KV-20FV12/21FV12/C ONLY)																	
R436	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R523	1-216-073-00	RES-CHIP	10K	5%	1/10W						
(ALL EXCEPT KV-20FV12/21FV12/C)																	
R524 1-249-429-11 CARBON 10K 5% 1/4W																	
R525 $\triangle$ 1-216-069-00 RES-CHIP 6.8K 5% 1/10W																	
R526 1-208-814-91 METAL CHIP 22K 0.50% 1/10W																	

## Note:

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## Note:

The components identified by  in this manual have been carefully factory-selected for each set in order to satisfy regulations regarding x-ray radiation. Should replacement be required, replace only with the value originally used.



REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
R527	1-216-081-00	RES-CHIP	22K	5%	1/10W	R606	1-205-998-11	CEMENTED	1	5%	10W
R528	1-249-421-11	CARBON	2.2K	5%	1/4W	R606	1-202-968-11	CEMENTED	1.2	5%	10W
R529	1-216-105-91	RES-CHIP	220K	5%	1/10W	(ALL EXCEPT KV-20FS12/20FV12)					
R530	1-216-101-00	RES-CHIP	150K	5%	1/10W	R607	1-215-859-00	METAL OXIDE	22	5%	1W
R531	1-216-085-00	RES-CHIP	33K	5%	1/10W	R608	1-240-205-11	CARBON	22M	5%	1/2W
R532	1-215-431-00	METAL	2.7K	1%	1/4W	R609	1-216-049-91	RES-CHIP	1K	5%	1/10W
R533	1-215-461-00	METAL	47K	1%	1/4W	R610	1-216-073-00	RES-CHIP	10K	5%	1/10W
R534	1-215-455-00	METAL	27K	1%	1/4W	R611	1-216-089-91	RES-CHIP	47K	5%	1/10W
R535	1-249-441-11	CARBON	100K	5%	1/4W	R612	1-216-045-00	RES-CHIP	680	5%	1/10W
R536	 1-216-355-11	METAL OXIDE	3.3	5%	1W	R613	 1-219-512-11	CARBON	2.2M	5%	1/2W
R538	 1-215-890-11	METAL OXIDE	470	5%	2W	R614	1-249-413-11	CARBON	470	5%	1/4W
R539	1-249-385-11	CARBON	2.2	5%	1/4W	R615	 1-218-265-11	METAL	8.2M	5%	1W
R540	1-249-425-11	CARBON	4.7K	5%	1/4W	(ALL EXCEPT KV-20FS12/20FV12)					
R541	1-249-429-11	CARBON	10K	5%	1/4W	R616	 1-260-302-51	CARBON	6.8	5%	1/2W
R542	 1-215-910-00	METAL OXIDE	68	5%	3W	R617	1-216-009-91	RES-CHIP	22	5%	1/10W
R543	1-247-887-00	CARBON	220K	5%	1/4W	R621	1-202-968-11	CEMENTED	1.2	5%	10W
R544	1-260-312-11	CARBON	47	5%	1/2W	(ALL EXCEPT KV-20FS12/20FV12)					
R546	 1-249-377-11	CARBON	0.47	5%	1/4W	R626	 1-220-926-11	FUSIBLE	0.47	10%	1/2W
R547	 1-215-892-11	METAL OXIDE	1K	5%	2W	R627	1-215-483-00	METAL	390K	1%	1/4W
R549	 1-260-288-11	CARBON	0.47	5%	1/2W	R627	1-215-479-00	METAL	270K	1%	1/4W
R550	 1-260-288-11	CARBON	0.47	5%	1/2W	(ALL EXCEPT KV-20FS12/20FV12)					
R552	 1-215-910-00	METAL OXIDE	68	5%	3W	R630	1-249-421-11	CARBON	2.2K	5%	1/4W
R553	 1-216-365-00	METAL OXIDE	0.47	5%	2W	R632	 1-216-361-21	METAL OXIDE	0.22	5%	2W
R554	 1-249-429-11	CARBON	10K	5%	1/4W	R633	1-249-415-11	CARBON	680	5%	1/4W
R555	 1-247-895-91	CARBON	470K	5%	1/4W	R634	1-216-073-00	RES-CHIP	10K	5%	1/10W
R556	 1-249-416-11	CARBON	820	5%	1/4W	R635	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R557	 1-247-895-91	CARBON	470K	5%	1/4W	R637	1-216-485-11	METAL OXIDE	5.6K	5%	3W
R558	 1-249-441-11	CARBON	100K	5%	1/4W	R638	1-249-399-11	CARBON	33	5%	1/4W
R559	 1-249-429-11	CARBON	10K	5%	1/4W	(KV-20FS12/20FV12 ONLY)					
R560	 1-215-902-11	METAL OXIDE	47K	5%	1W	R638	1-249-402-11	CARBON	56	5%	1/4W
R561	 1-215-416-00	METAL	620	1%	1/4W	(ALL EXCEPT KV-20FS12/20FV12)					
R562	 1-208-806-11	METAL CHIP	10K	0.50%	1/10W	R639	1-249-421-11	CARBON	2.2K	5%	1/4W
R563	 1-249-441-11	CARBON	100K	5%	1/4W	R640	1-249-417-11	CARBON	1K	5%	1/4W
R565	 1-249-429-11	CARBON	10K	5%	1/4W	(ALL EXCEPT KV-20FS12/20FV12)					
R566	 1-216-073-00	RES-CHIP	10K	5%	1/10W	R641	 1-216-363-00	METAL OXIDE	0.33	5%	2W
R567	 1-216-073-00	RES-CHIP	10K	5%	1/10W	R642	1-216-089-91	RES-CHIP	47K	5%	1/10W
R568	 1-215-882-00	METAL OXIDE	22	5%	2W	R643	1-249-419-11	CARBON	1.5K	5%	1/4W
R571	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R644	1-247-843-11	CARBON	3.3K	5%	1/4W
R572	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R645	1-215-898-11	METAL OXIDE	10K	5%	2W
R573	1-216-109-00	RES-CHIP	330K	5%	1/10W	R646	1-249-419-11	CARBON	1.5K	5%	1/4W
R601	 1-219-513-11	CARBON	4.7M	5%	1/2W	R648	1-215-908-00	METAL OXIDE	33	5%	3W
			(KV-20FS12/20FV12 ONLY)			R650	1-216-387-11	METAL OXIDE	0.68	5%	3W
R602	 1-249-389-11	CARBON	4.7	5%	1/4W	R653	1-216-049-91	RES-CHIP	1K	5%	1/10W
R603	1-215-485-00	METAL	470K	1%	1/4W	R655	1-216-049-91	RES-CHIP	1K	5%	1/10W
R605	 1-205-998-11	CEMENTED	1	5%	10W	(ALL EXCEPT KV-20FS12/20FV12)					
R605	 1-202-968-11	CEMENTED	1.2	5%	10W	R656	1-249-429-11	CARBON	10K	5%	1/4W
			(ALL EXCEPT KV-20FS12/20FV12)			R658	1-216-387-11	METAL OXIDE	0.68	5%	3W
						R659	1-215-857-11	METAL OXIDE	10	5%	1W
						R660	1-215-924-00	METAL OXIDE	15K	5%	3W

A CB

**Note:**

The components identified by shading and mark  $\Delta$  are critical for safety. Replace only with part number specified.

**Note:**

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REF.NO.	PART NO.	DESCRIPTION	REMARK		
		(KV-20FS12/20FV12 ONLY)			
R660	1-216-485-11	METAL OXIDE	5.6K	5%	3W
		(ALL EXCEPT KV-20FS12/20FV12)			
R661	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R662	$\Delta$ 1-216-485-11	METAL OXIDE	5.6K	5%	3W
		(ALL EXCEPT KV-20FS12/20FV12)			
R663	1-216-081-00	RES-CHIP	22K	5%	1/10W
R2001	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R2002	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R2003	1-249-425-11	CARBON	4.7K	5%	1/4W
R2004	1-216-069-00	RES-CHIP	6.8K	5%	1/10W
R2005	1-216-295-91	SHORT			
		(ALL EXCEPT KV-20FV12/21FV12/C)			
R2007	1-249-413-11	CARBON	470	5%	1/4W
		(KV-21FE12A ONLY)			
R2011	1-249-415-11	CARBON	680	5%	1/4W
R2012	1-249-416-11	CARBON	820	5%	1/4W
R2013	1-249-421-11	CARBON	2.2K	5%	1/4W
R2014	1-249-427-11	CARBON	6.8K	5%	1/4W

**RELAY**

RY601	$\Delta$ 1-755-198-11	RELAY
RY602	$\Delta$ 1-755-266-11	RELAY, AC POWER

**SWITCH**

S2001	1-692-431-21	SWITCH, TACTILE
S2002	1-692-431-21	SWITCH, TACTILE
S2003	1-692-431-21	SWITCH, TACTILE
S2004	1-692-431-21	SWITCH, TACTILE
S2005	1-692-431-21	SWITCH, TACTILE
S2006	1-692-431-21	SWITCH, TACTILE
S2007	1-762-816-11	SWITCH, TACTILE
S2008	1-762-816-11	SWITCH, TACTILE

**SWITCH**

SW502	1-572-707-11	SWITCH, LEVER
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**TRANSFORMER**

T501	$\Delta$ 1-435-374-11	TRANSFORMER, FERRITE (HDT)
T504	$\Delta$ 1-435-079-11	TRANSFORMER, HORIZONTAL LINEAR
T505	$\Delta$ 1-453-316-21	FBT ASSY NX-1748//X4A4
T602	$\Delta$ 1-431-419-11	TRANSFORMER, LINE FILTER (KV-20FS12/20FV12 ONLY)
T602	$\Delta$ 1-426-717-11	TRANSFORMER, LINE FILTER (LFT) (ALL EXCEPT KV-20FS12/20FV12)

T603	$\Delta$ 1-433-806-11	TRANSFORMER, REGULATOR
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**REF.NO.** **PART NO.** **DESCRIPTION** **REMARK**

		(KV-20FS12/20FV12 ONLY)	
T603	$\Delta$ 1-433-807-11	TRANSFORMER, REGULATOR	(ALL EXCEPT KV-20FS12/20FV12)
T604	$\Delta$ 1-431-852-11	TRANSFORMER, CONVERTER (SRT)	

**THERMISTOR**

TH601	$\Delta$ 1-803-586-11	THERMISTOR, NTC
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**THERMISTOR**

THP601	$\Delta$ 1-809-539-11	THERMISTOR, POSITIVE (KV-20FS12/20FV12 ONLY)
THP601	$\Delta$ 1-803-540-11	THERMISTOR (ALL EXCEPT KV-20FS12/20FV12)

**TUNER**

TU101	$\Delta$ 8-598-542-00	TUNER, FSS BTF-WA412 (KV-21FE12A ONLY)
TU101	$\Delta$ 8-598-431-30	TUNER, FSS BTF-WA411 (ALL EXCEPT KV-21FM12/21FE12A)
TU101	$\Delta$ 8-598-501-00	TUNER, FSS BTF-FA402 (KV-21FM12 ONLY)

**VARISTOR**

VDR601	$\Delta$ 1-803-585-11	VARISTOR ENE271D-10A (KV-20FS12/20FV12 ONLY)
VDR601	$\Delta$ 1-803-967-11	VARISTOR (ENE621D-14A) (ALL EXCEPT KV-20FS12/20FV12)

CB

\* A-1332-035-A CB (VAR) MOUNTED PC BOARD

4-382-854-11 SCREW (M3X10), P, SW (+)

**CAPACITOR**

C701	1-104-664-11	ELECT	47 $\mu$ F	20%	25V
C702	1-136-165-00	MYLAR	0.1 $\mu$ F	5%	50V
C703	1-104-664-11	ELECT	47 $\mu$ F	20%	25V
C704	1-107-649-11	ELECT	2.2 $\mu$ F	20%	250V
C705	1-107-652-11	ELECT	10 $\mu$ F	20%	250V
C707	1-162-114-00	CERAMIC	0.0047 $\mu$ F		2KV

**Note:**

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**Note:**

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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
C708	1-136-165-00	MYLAR	0.1 $\mu$ F	5%	50V	R709	1-247-807-31	CARBON	100	5%	1/4W
C709	1-126-934-11	ELECT	220 $\mu$ F	20%	16V	R710	1-247-807-31	CARBON	100	5%	1/4W
C710	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	R711	1-260-099-11	CARBON	1K	5%	1/2W
<b>CONNECTOR</b>											
CN701 *	1-564-506-11	PLUG, CONNECTOR 3P				R712	1-260-099-11	CARBON	1K	5%	1/2W
CN702	1-695-915-11	TAB (CONTACT)				R713	1-260-099-11	CARBON	1K	5%	1/2W
CN704	1-784-281-11	HOUSING, CONNECTOR 1P				R714	1-260-087-11	CARBON	100	5%	1/2W
CN705 *	1-564-512-11	PLUG, CONNECTOR 9P				R715	1-260-132-11	CARBON	560K	5%	1/2W
CN706 *	1-564-509-11	PLUG, CONNECTOR 6P				R716	1-260-123-11	CARBON	100K	5%	1/2W
<b>DIODE</b>											
D701	8-719-901-83	DIODE 1SS83TD				R718	1-216-375-00	METAL OXIDE	3.3	5%	2W
D702	8-719-901-83	DIODE 1SS83TD				R719	1-215-888-00	METAL OXIDE	220	5%	2W
D703	8-719-901-83	DIODE 1SS83TD				R720	1-249-421-11	CARBON	2.2K	5%	1/4W
D704	8-719-302-43	DIODE RGP10GPKG23				R721	1-249-421-11	CARBON	2.2K	5%	1/4W
<b>VARIABLE RESISTOR</b>											
RV701	1-241-656-11	RES, ADJ, METAL FILM									110M
<b>IC</b>											
IC701	8-759-803-42	IC LA6500-FA									
IC702	8-759-562-43	IC TDA6108JF/N1B									
<b>JACK</b>											
J701	$\triangle$ 1-451-470-21	SOCKET, CRT									
<b>COIL</b>											
L701	1-408-613-31	INDUCTOR	68 $\mu$ H								
<b>TRANSISTOR</b>											
Q700	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA									
Q701	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA									
<b>RESISTOR</b>											
R700	1-247-863-91	CARBON	22K	5%	1/4W						
R701	1-249-429-11	CARBON	10K	5%	1/4W						
R702	1-247-815-91	CARBON	220	5%	1/4W						
R703	1-247-807-31	CARBON	100	5%	1/4W						
R704	1-249-421-11	CARBON	2.2K	5%	1/4W						
R705	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R706	1-249-381-11	CARBON	1	5%	1/4W						
R707	1-249-383-11	CARBON	1.5	5%	1/4W						
R708	1-247-807-31	CARBON	100	5%	1/4W						
<b>SWITCH</b>											
S901	$\triangle$ 1-571-433-21	SWITCH, PUSH (AC POWER)									
<b>K</b>											
<b>CAPACITOR</b>											
C201	1-126-963-11	ELECT		4.7 $\mu$ F	20.00%	50V					
C202	1-126-963-11	ELECT		4.7 $\mu$ F	20.00%	50V					
C404	1-164-182-11	CERAMIC CHIP		0.0033 $\mu$ F	10.00%	50V					
C405	1-163-034-00	CERAMIC CHIP		0.033 $\mu$ F		50V					
C406	1-163-011-11	CERAMIC CHIP		0.0015 $\mu$ F	10.00%	50V					
C407	1-164-222-11	CERAMIC CHIP		0.22 $\mu$ F		25V					
C408	1-164-222-11	CERAMIC CHIP		0.22 $\mu$ F		25V					
C409	1-163-011-11	CERAMIC CHIP		0.0015 $\mu$ F	10.00%	50V					



## Note:

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## Note:

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REF.NO.	PART NO.	DESCRIPTION	REMARK		REF.NO.	PART NO.	DESCRIPTION	REMARK		
C410	1-163-034-00	CERAMIC CHIP	0.033 $\mu$ F	50V	R407	1-216-025-91	RES-CHIP	100	5% 1/10W	
C411	1-164-182-11	CERAMIC CHIP	0.0033 $\mu$ F	10.00% 50V	R408	1-216-025-91	RES-CHIP	100	5% 1/10W	
C412	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	R409	1-216-025-91	RES-CHIP	100	5% 1/10W	
C413	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V	R410	1-216-025-91	RES-CHIP	100	5% 1/10W	
C414	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V	R450	1-216-025-91	RES-CHIP	100	5% 1/10W	
C415	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V	R451	1-216-025-91	RES-CHIP	100	5% 1/10W	
C416	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C417	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C418	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V						
C419	1-164-346-11	CERAMIC CHIP	1 $\mu$ F	16V						
C422	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C423	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C450	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C451	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C458	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C459	1-126-963-11	ELECT	4.7 $\mu$ F	20.00% 50V						
C460	1-126-965-11	ELECT	22 $\mu$ F	20.00% 50V						
<b>CONNECTOR</b>										
CN450	1-573-301-21	CONNECTOR, BOARD TO BOARD 20P			<b>CAPACITOR</b>					
<b>IC</b>										
IC404	8-759-658-01	IC NJW1130G	C1002	1-107-698-11	ELECT	10 $\mu$ F	20%	25V		
<b>CHIP CONDUCTOR</b>										
JR402	1-216-295-91	SHORT	C1005	1-163-259-91	CERAMIC CHIP	220PF	5%	50V		
JR405	1-216-295-91	SHORT	C1008	1-126-964-11	ELECT	10 $\mu$ F	20%	50V		
JR406	1-216-295-91	SHORT	C1010	1-163-035-00	CERAMIC CHIP	0.047 $\mu$ F	50V			
JR407	1-216-295-91	SHORT	C1011	1-163-259-91	CERAMIC CHIP	220PF	5%	50V		
JR408	1-216-295-91	SHORT	C1012	1-126-960-11	ELECT	1 $\mu$ F	20%	50V		
JR420	1-216-295-91	SHORT	C1013	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V		
JR421	1-216-295-91	SHORT	C1014	1-130-495-00	MYLAR	0.1 $\mu$ F	5%	50V		
JR422	1-216-295-91	SHORT	C1015	1-163-231-11	CERAMIC CHIP	15PF	5%	50V		
JR426	1-216-295-91	SHORT	C1016	1-163-231-11	CERAMIC CHIP	15PF	5%	50V		
JR427	1-216-295-91	SHORT	C1018	1-126-960-11	ELECT	1 $\mu$ F	20%	50V		
JR428	1-216-295-91	SHORT	C1019	1-104-664-11	ELECT	47 $\mu$ F	20%	25V		
JR429	1-216-295-91	SHORT	C1020	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%	50V		
JR450	1-216-295-91	SHORT	C1021	1-163-259-91	CERAMIC CHIP	220PF	5%	50V		
JR451	1-216-295-91	SHORT	C1022	1-163-135-00	CERAMIC CHIP	560PF	5%	50V		
JR452	1-216-295-91	SHORT	C1023	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V		
<b>RESISTOR</b>										
R403	1-216-025-91	RES-CHIP	100	5%	1/10W	C1024	1-163-259-91	CERAMIC CHIP	220PF	5% 50V
R404	1-216-025-91	RES-CHIP	100	5%	1/10W	C1026	1-163-259-91	CERAMIC CHIP	220PF	5% 50V
R405	1-216-025-91	RES-CHIP	100	5%	1/10W	C1027	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V
R406	1-216-025-91	RES-CHIP	100	5%	1/10W	C1028	1-163-259-91	CERAMIC CHIP	220PF	5% 50V
						C1029	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10% 50V
						C1030	1-115-566-11	CERAMIC CHIP	4.7 $\mu$ F	10.00% 10V
						C1031	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10% 50V
						C1032	1-163-133-00	CERAMIC CHIP	470PF	5% 50V
						C1034	1-163-259-91	CERAMIC CHIP	220PF	5% 50V

## Note:

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## Note:

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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
C1035	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	C1332	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1036	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V	C1334	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1037	1-163-010-11	CERAMIC CHIP	0.0012 $\mu$ F	10%	50V	C1335	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1038	1-163-010-11	CERAMIC CHIP	0.0012 $\mu$ F	10%	50V	C1336	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1039	1-163-010-11	CERAMIC CHIP	0.0012 $\mu$ F	10%	50V	C1339	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1040	1-163-010-11	CERAMIC CHIP	0.0012 $\mu$ F	10%	50V	C1340	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
C1041	1-126-935-11	ELECT	470 $\mu$ F	20%	16V	C1341	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1042	1-164-161-11	CERAMIC CHIP	0.0022 $\mu$ F	10%	50V	C1342	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1043	1-163-809-11	CERAMIC CHIP	0.047 $\mu$ F	10%	25V	C1343	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	
C1048	1-137-194-81	MYLAR	0.47 $\mu$ F	5%	50V	C1344	1-126-935-11	ELECT	470 $\mu$ F	20%	16V
C1049	1-163-017-00	CERAMIC CHIP	0.0047 $\mu$ F	10%	50V	C1345	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1050	1-163-037-11	CERAMIC CHIP	0.022 $\mu$ F	10%	50V	C1349	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1053	1-163-229-11	CERAMIC CHIP	12PF	5%	50V	C1350	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1055	1-163-229-11	CERAMIC CHIP	12PF	5%	50V	C1351	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
C1056	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C1352	1-104-664-11	ELECT	47 $\mu$ F	20%	25V
C1058	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C1353	1-126-964-11	ELECT	10 $\mu$ F	20%	50V
C1060	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C1354	1-126-959-11	ELECT	0.47 $\mu$ F	20%	50V
C1066	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V				(ALL EXCEPT KV-21FE12A)		
C1068	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C1354	1-126-957-11	ELECT	0.22 $\mu$ F	20.00%	50V
C1071	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C1355	1-126-767-11	ELECT	1000 $\mu$ F	20%	16V
C1072	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	C1356	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C1073	1-163-259-91	CERAMIC CHIP	220PF	5%	50V				(ALL EXCEPT KV-21FE12A)		
C1074	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	C1356	1-163-259-91	CERAMIC CHIP	220PF	5.00%	50V
C1075	1-126-935-11	ELECT	470 $\mu$ F	20%	16V	C1357	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	
C1076	1-126-959-11	ELECT	0.47 $\mu$ F	20%	50V	C1358	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
C1077	1-126-964-11	ELECT	10 $\mu$ F	20%	50V	C1359	1-126-964-11	ELECT	10 $\mu$ F	20%	50V
C1099	1-163-009-11	CERAMIC CHIP	0.001 $\mu$ F	10%	50V	C1361	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C1304	1-126-959-11	ELECT	0.47 $\mu$ F	20%	50V	C1363	1-163-233-11	CERAMIC CHIP	18PF	5.00%	50V
C1305	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V				(KV-21FE12A ONLY)		
C1306	1-126-933-11	ELECT	100 $\mu$ F	20%	16V	C1357	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	
C1307	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1358	1-126-963-11	ELECT	4.7 $\mu$ F	20%	50V
C1308	1-126-933-11	ELECT	100 $\mu$ F	20%	16V	C1359	1-126-964-11	ELECT	10 $\mu$ F	20%	50V
C1309	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1361	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C1310	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1363	1-163-233-11	CERAMIC CHIP	18PF	5.00%	50V
C1311	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V					(KV-21FE12A ONLY)		
C1313	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1364	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C1315	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1365	1-163-233-11	CERAMIC CHIP	18PF	5.00%	50V
C1320	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V				(KV-21FE12A ONLY)		
C1321	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1366	1-126-964-11	ELECT	10 $\mu$ F	20%	50V
C1322	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1367	1-126-964-11	ELECT	10 $\mu$ F	20%	50V
C1323	1-126-933-11	ELECT	100 $\mu$ F	20%	16V				(KV-20FV12/21FV12/C ONLY)		
C1324	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1375	1-163-034-00	CERAMIC CHIP	0.033 $\mu$ F	50V	
C1325	1-163-123-00	CERAMIC CHIP	180PF	5%	50V	C1376	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C1326	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1377	1-126-960-11	ELECT	1 $\mu$ F	20%	50V
C1327	1-126-933-11	ELECT	100 $\mu$ F	20%	16V	C1378	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	
C1328	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V	C1379	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V
C1329	1-163-010-11	CERAMIC CHIP	0.0012 $\mu$ F	10%	50V				(ALL EXCEPT KV-21FE12A)		
C1330	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	C1379	1-163-017-00	CERAMIC CHIP	0.0047 $\mu$ F	10.00%	
C1331	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V				(KV-21FE12A ONLY)		
C1332	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1380	1-163-003-11	CERAMIC CHIP	330PF	10%	50V
C1333	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1381	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	
C1334	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1382	1-126-964-11	ELECT	10 $\mu$ F	20%	50V
C1335	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1383	1-126-964-11	ELECT	10 $\mu$ F	20%	50V
C1336	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1384	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	
C1337	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1385	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	25V	
C1338	1-163-021-91	CERAMIC CHIP	0.01 $\mu$ F	10%	50V	C1386	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F	25V	

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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK
C1387	1-163-133-00	CERAMIC CHIP	470PF	5%	50V	IC1305	8-759-658-02	IC BA3993F	
C1389	1-163-038-91	CERAMIC CHIP	0.1 $\mu$ F		25V				
		(KV-20FV12/21FV12/C ONLY)							
C1392	1-163-231-11	CERAMIC CHIP	15PF	5%	50V				<u>CHIP CONDUCTOR</u>
C1394	1-104-664-11	ELECT	47 $\mu$ F	20%	25V	JR0002	1-216-295-91	SHORT	
C1399	1-163-243-11	CERAMIC CHIP	47PF	5%	50V	JR1000	1-216-295-91	SHORT	
						JR1001	1-216-295-91	SHORT	
						JR1002	1-216-295-91	SHORT	
						JR1003	1-216-295-91	SHORT	
<u>CONNECTOR</u>									
CN1001 *	1-564-511-11	PLUG, CONNECTOR 8P				JR1004	1-216-295-91	SHORT	
CN1002 *	1-560-124-00	PLUG, CONNECTOR (2.5MM) 4P				JR1005	1-216-295-91	SHORT	
CN1003	1-573-301-21	CONNECTOR, BOARD TO 20P				JR1006	1-216-295-91	SHORT	
CN1004	1-573-301-21	CONNECTOR, BOARD TO 20P				JR1007	1-216-295-91	SHORT	
						JR1008	1-216-295-91	SHORT	
<u>DIODE</u>									
D1001	8-719-921-44	DIODE MTZJ-T-77-5.1C				JR1009	1-216-295-91	SHORT	
D1003	8-719-976-99	DIODE UDZ-TE-17-5.1B				JR1010	1-216-295-91	SHORT	
D1005	8-719-109-89	DIODE MTZJ-T-77-5.6C				JR1011	1-216-295-91	SHORT	
D1006	8-719-073-01	DIODE MA111-TX				JR1012	1-216-295-91	SHORT	
		(KV-20FS12/21FE12/A/C ONLY)				JR1013	1-216-295-91	SHORT	
D1010	8-719-977-22	DIODE UDZ-TE-17-9.1B				JR1014	1-216-295-91	SHORT	
D1011	8-719-073-01	DIODE MA111-TX				JR1015	1-216-295-91	SHORT	
D1012	8-719-073-01	DIODE MA111-TX				JR1016	1-216-295-91	SHORT	
D1013	8-719-977-22	DIODE UDZ-TE-17-9.1B				JR1017	1-216-295-91	SHORT	
D1014	8-719-073-01	DIODE MA111-TX				JR1018	1-216-295-91	SHORT	
D1301	8-719-914-44	DIODE DAP202K-T-146				JR1083	1-216-295-91	SHORT (EXCEPT KV-20FV12/21FV12/C/21FE12A)	
D1310	8-719-976-99	DIODE UDZ-TE-17-5.1B				JR1300	1-216-295-91	SHORT	
						JR1301	1-216-295-91	SHORT	
						JR1302	1-216-295-91	SHORT	
						JR1303	1-216-295-91	SHORT	
<u>FERRITE BEAD</u>									
FB1301	1-412-911-11	FERRITE	0 $\mu$ H			JR1304	1-216-295-91	SHORT	
FB1302	1-412-911-11	FERRITE	0 $\mu$ H			JR1305	1-216-295-91	SHORT	
						JR1306	1-216-295-91	SHORT	
						JR1307	1-216-295-91	SHORT	
						JR1308	1-216-295-91	SHORT	
						JR1309	1-216-295-91	SHORT	
						JR1310	1-216-295-91	SHORT	
						JR1311	1-216-295-91	SHORT	
						JR1312	1-216-295-91	SHORT	
<u>FILTER</u>									
FL1301	1-239-847-11	FILTER, LOW PASS				JR1313	1-216-295-91	SHORT	
FL1302	1-239-847-11	FILTER, LOW PASS				JR1314	1-216-295-91	SHORT	
FL1303	1-239-847-11	FILTER, LOW PASS				JR1315	1-216-295-91	SHORT	
						JR1316	1-216-295-91	SHORT	
						JR1317	1-216-295-91	SHORT	
<u>IC</u>									
IC1001	8-759-658-03	IC M37273MF-258SP				JR1318	1-216-295-91	SHORT	
IC1002	8-759-353-00	IC NJM2534M(TE2)				JR1319	1-216-295-91	SHORT	
		(KV-20FV12/21FV12/C ONLY)				JR1320	1-216-295-91	SHORT	
IC1003	8-759-527-77	IC M24C16-MN6T				JR1321	1-216-295-91	SHORT	
IC1301	8-752-092-17	IC CXA2131AS (ALL EXCEPT KV-21FE12A)				JR1322	1-216-295-91	SHORT	
IC1301	8-752-090-40	IC CXA2135S (KV-21FE12A ONLY)				JR1323	1-216-295-91	SHORT	
IC1302	8-759-655-75	IC TC90A49P							
IC1304	8-759-353-00	IC NJM2534M(TE2)							

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<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>	<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>
JR1324	1-216-295-91	SHORT	<b>RESISTOR</b>				
JR1325	1-216-295-91	SHORT		R556	1-216-295-91	SHORT	
<b>COIL</b>							
L1001	1-414-273-11	INDUCTOR	100 $\mu$ H	R1001	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
L1003	1-414-273-11	INDUCTOR	100 $\mu$ H	R1016	1-216-049-91	RES-CHIP	1K 5% 1/10W
L1004	1-410-463-11	INDUCTOR	2.7 $\mu$ H	R1017	1-216-025-91	RES-CHIP	100 5% 1/10W
L1302	1-414-267-11	INDUCTOR	10 $\mu$ H	R1018	1-249-429-11	CARBON	10K 5% 1/4W
L1303	1-414-267-11	INDUCTOR	10 $\mu$ H	R1019	1-216-045-00	RES-CHIP	680 5% 1/10W
L1304	1-414-267-11	INDUCTOR	10 $\mu$ H	R1020	1-216-097-91	RES-CHIP	100K 5% 1/10W
L1305	1-414-267-11	INDUCTOR	10 $\mu$ H	R1021	1-216-121-91	RES-CHIP	1M 5% 1/10W
L1310	1-414-267-11	INDUCTOR	10 $\mu$ H	R1022	1-216-073-00	RES-CHIP	10K 5% 1/10W
L1311	1-414-271-11	INDUCTOR	47 $\mu$ H	R1023	1-216-073-00	RES-CHIP	10K 5% 1/10W
L1315	1-414-267-11	INDUCTOR	10 $\mu$ H	R1024	1-216-033-00	RES-CHIP	220 5% 1/10W
<b>TRANSISTOR</b>							
Q1001	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1025	1-208-814-91	METAL CHIP	22K 1% 1/10W
Q1002	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1026	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1003	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1027	1-216-041-00	RES-CHIP	470 5% 1/10W
Q1009	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1028	1-216-045-00	RES-CHIP	680 5% 1/10W
Q1010	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX	(ALL EXCEPT KV-20FS12/21FE12/C)	R1029	1-216-113-00	RES-CHIP	470K 5% 1/10W
Q1010	8-729-120-28	TRANSISTOR 2SC2412K-T-146-QR (KV-20FS12/21FE12/C ONLY)		R1030	1-216-049-91	RES-CHIP	1K 5% 1/10W
Q1011	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1031	1-216-041-00	RES-CHIP	470 5% 1/10W
Q1301	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1032	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1302	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1033	1-216-081-00	RES-CHIP	22K 5% 1/10W
Q1306	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1034	1-216-043-91	RES-CHIP	560 5% 1/10W
Q1307	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1035	1-216-049-91	RES-CHIP	1K 5% 1/10W
Q1308	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1036	1-216-033-00	RES-CHIP	220 5% 1/10W
Q1310	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1037	1-216-033-00	RES-CHIP	220 5% 1/10W
Q1311	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1038	1-216-025-91	RES-CHIP	100 5% 1/10W
Q1312	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1040	1-216-033-00	RES-CHIP	220 5% 1/10W
Q1313	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1041	1-216-073-00	RES-CHIP	10K 5% 1/10W
Q1315	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1042	1-249-413-11	CARBON	470 5% 1/4W
Q1316	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		(ALL EXCEPT KV-21FM12/21FE12A)			
Q1317	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1042	1-249-414-11	CARBON	560 5% 1/4W
Q1325	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		(KV-21FM12 ONLY)			
Q1326	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1043	1-216-071-00	RES-CHIP	8.2K 5% 1/10W
Q1327	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1044	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1328	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1045	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1329	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1046	1-249-425-11	CARBON	4.7K 5% 1/4W
Q1330	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1047	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1331	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1048	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1332	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1049	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1336	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1050	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1337	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1052	1-216-033-00	RES-CHIP	220 5% 1/10W
Q1338	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1053	1-216-033-00	RES-CHIP	220 5% 1/10W
Q1339	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1054	1-216-065-91	RES-CHIP	4.7K 5% 1/10W
Q1340	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1055	1-216-049-91	RES-CHIP	1K 5% 1/10W
Q1341	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1056	1-216-081-00	RES-CHIP	22K 5% 1/10W
Q1342	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1057	1-216-049-91	RES-CHIP	1K 5% 1/10W
Q1343	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX		R1058	1-216-635-11	METAL CHIP	220 1% 1/10W
Q1344	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1059	1-247-815-91	CARBON	220 5% 1/4W
Q1345	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX		R1060	1-216-635-11	METAL CHIP	220 1% 1/10W



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REF.NO.	PART NO.	DESCRIPTION	REMARK			REF.NO.	PART NO.	DESCRIPTION	REMARK		
R1061	1-247-815-91	CARBON	220	5%	1/4W	R1311	1-216-047-91	RES-CHIP	820	5%	1/10W
R1062	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1312	1-208-806-11	METAL CHIP	10K	1%	1/10W
R1063	1-216-033-00	RES-CHIP	220	5%	1/10W	R1313	1-216-033-00	RES-CHIP	220	5%	1/10W
R1064	1-216-025-91	RES-CHIP	100	5%	1/10W	R1314	1-216-022-00	RES-CHIP	75	5%	1/10W
R1065	1-216-033-00	RES-CHIP	220	5%	1/10W	R1315	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R1066	1-216-033-00	RES-CHIP	220	5%	1/10W	R1316	1-216-295-91	SHORT			
R1067	1-216-033-00	RES-CHIP	220	5%	1/10W	R1317	1-216-022-00	RES-CHIP	75	5%	1/10W
R1068	1-216-025-91	RES-CHIP	100	5%	1/10W			(KV-20FV12/21FV12/C ONLY)			
R1069	1-216-033-00	RES-CHIP	220	5%	1/10W	R1318	1-216-022-00	RES-CHIP	75	5%	1/10W
R1070	1-216-033-00	RES-CHIP	220	5%	1/10W	R1319	1-216-022-00	RES-CHIP	75	5%	1/10W
R1071	1-208-806-11	METAL CHIP	10K	1%	1/10W	R1320	1-216-025-91	RES-CHIP	100	5%	1/10W
R1072	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1322	1-216-081-00	RES-CHIP	22K	5%	1/10W
R1073	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1323	1-216-025-91	RES-CHIP	100	5%	1/10W
R1074	1-216-355-11	METAL OXIDE	3.3	5%	1W	R1325	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1075	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1326	1-216-043-91	RES-CHIP	560	5%	1/10W
R1076	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1327	1-216-025-91	RES-CHIP	100	5%	1/10W
R1077	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1328	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R1078	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1329	1-216-091-00	RES-CHIP	56K	5%	1/10W
R1079	1-216-069-00	RES-CHIP	6.8K	5%	1/10W	R1330	1-216-081-00	RES-CHIP	22K	5%	1/10W
R1080	1-216-069-00	RES-CHIP	6.8K	5%	1/10W	R1331	1-216-049-91	RES-CHIP	1K	5%	1/10W
R1081	1-216-069-00	RES-CHIP	6.8K	5%	1/10W	R1332	1-216-043-91	RES-CHIP	560	5%	1/10W
R1082	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1333	1-216-033-00	RES-CHIP	220	5%	1/10W
R1084	1-216-045-00	RES-CHIP	680	5%	1/10W	R1334	1-216-025-91	RES-CHIP	100	5%	1/10W
R1085	1-216-045-00	RES-CHIP	680	5%	1/10W	R1335	1-216-025-91	RES-CHIP	100	5%	1/10W
R1086	1-216-045-00	RES-CHIP	680	5%	1/10W	R1336	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R1087	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	R1338	1-216-091-00	RES-CHIP	56K	5%	1/10W
R1088	1-216-295-91	SHORT				R1342	1-216-025-91	RES-CHIP	100	5%	1/10W
R1090	1-216-033-00	RES-CHIP	220	5%	1/10W	R1344	1-216-025-91	RES-CHIP	100	5%	1/10W
R1095	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	R1345	1-216-049-91	RES-CHIP	1K	5%	1/10W
		(ALL EXCEPT KV-20FV12/21FV12/C)				R1346	1-216-033-00	RES-CHIP	220	5%	1/10W
R1098	1-216-033-00	RES-CHIP	220	5%	1/10W	R1347	1-216-025-91	RES-CHIP	100	5%	1/10W
R1099	1-208-798-11	METAL CHIP	4.7K	1%	1/10W	R1348	1-216-025-91	RES-CHIP	100	5%	1/10W
R1103	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1349	1-216-295-91	SHORT	0		
R1104	1-216-065-91	RES-CHIP	4.7K	5%	1/10W			(KV-21FE12A ONLY)			
R1105	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1350	1-216-073-00	RES-CHIP	10K	5%	1/10W
R1106	1-216-085-00	RES-CHIP	33K	5%	1/10W	R1351	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
		(KV-20FS12/21FE12/A/C ONLY)				R1352	1-216-049-91	RES-CHIP	1K	5%	1/10W
R1108	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1355	1-216-025-91	RES-CHIP	100	5%	1/10W
R1109	1-216-073-00	RES-CHIP	10K	5%	1/10W	R1356	1-216-067-00	RES-CHIP	5.6K	5%	1/10W
R1110	1-216-059-00	RES-CHIP	2.7K	5%	1/10W	R1357	1-216-043-91	RES-CHIP	560	5%	1/10W
R1111	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	R1358	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1300	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1359	1-216-025-91	RES-CHIP	100	5%	1/10W
R1301	1-216-053-00	RES-CHIP	1.5K	5%	1/10W	R1360	1-216-041-00	RES-CHIP	470	5%	1/10W
R1302	1-216-041-00	RES-CHIP	470	5%	1/10W	R1361	1-216-295-91	SHORT			
R1303	1-216-025-91	RES-CHIP	100	5%	1/10W	R1362	1-216-065-91	RES-CHIP	4.7K	5%	1/10W
R1304	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1363	1-216-043-91	RES-CHIP	560	5%	1/10W
R1306	1-216-033-00	RES-CHIP	220	5%	1/10W	R1364	1-216-025-91	RES-CHIP	100	5%	1/10W
R1308	1-216-033-00	RES-CHIP	220	5%	1/10W	R1365	1-216-025-91	RES-CHIP	100	5%	1/10W
R1310	1-216-025-91	RES-CHIP	100	5%	1/10W						

**Note:**

The components identified by shading and mark  $\triangle$  are critical for safety. Replace only with part number specified.

**Note:**

Les composants identifiés par un trame et une marque  $\triangle$  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>			<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>		
R1366	1-216-025-91	RES-CHIP	100	5%	1/10W	R1410	1-216-295-91	SHORT			
R1367	1-216-025-91	RES-CHIP	100	5%	1/10W			(ALL EXCEPT KV-20FV12/21FV12/C)			
R1368	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	R1411	1-216-033-00	RES-CHIP	220	5%	1/10W
			(ALL EXCEPT KV-20FV12/21FV12/C)			R1412	1-216-635-11	METAL CHIP	220	1%	1/10W
R1369	1-259-884-11	CARBON	4.7M	5%	1/4W	R1413	1-216-091-00	RES-CHIP	56K	5%	1/10W
			(KV-21FE12A ONLY)			R1414	1-216-049-91	RES-CHIP	1K	5%	1/10W
R1371	1-216-295-91	SHORT (KV-21FE12A ONLY)				R1415	1-216-049-91	RES-CHIP	1K	5%	1/10W
R1372	1-216-295-91	SHORT				R1416	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R1373	1-216-295-91	SHORT (KV-21FE12A ONLY)				R1417	1-216-035-00	RES-CHIP	270	5%	1/10W
R1374	1-216-049-91	RES-CHIP	1K	5%	1/10W	R1418	1-216-045-00	RES-CHIP	680	5%	1/10W
R1375	1-216-295-91	SHORT				R1419	1-216-295-91	SHORT			
R1376	1-216-295-91	SHORT				R1442	1-216-103-00	RES-CHIP	180K	5%	1/10W
R1378	1-216-295-91	SHORT						(ALL EXCEPT KV-21FE12A)			
R1379	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	R1442	1-216-107-00	RES-CHIP	270K	5%	1/10W
R1380	1-216-057-00	RES-CHIP	2.2K	5%	1/10W			(KV-21FE12A ONLY)			
R1381	1-216-057-00	RES-CHIP	2.2K	5%	1/10W						
R1382	1-216-097-91	RES-CHIP	100K	5%	1/10W						
			<b>CRYSTAL</b>								
R1383	1-216-097-91	RES-CHIP	100K	5%	1/10W	X1001	1-767-487-11	VIBRATOR, CRYSTAL			
R1384	1-216-097-91	RES-CHIP	100K	5%	1/10W	X1303	1-579-973-11	VIBRATOR, CRYSTAL			
R1385	1-216-113-00	RES-CHIP	470K	5%	1/10W			(KV-21FE12A ONLY)			
			(ALL EXCEPT KV-21FE12A)			X1304	1-567-505-11	VIBRATOR, CRYSTAL			
R1386	1-216-073-00	RES-CHIP	10K	5%	1/10W	X1305	1-579-972-11	VIBRATOR, CRYSTAL			
R1387	1-216-095-00	RES-CHIP	82K	5%	1/10W			(KV-21FE12A ONLY)			
R1387	1-216-085-00	RES-CHIP	33K	5%	1/10W						
			(KV-21FE12A ONLY)								
R1388	1-216-129-00	RES-CHIP	2.2M	5%	1/10W						
R1389	1-216-071-00	RES-CHIP	8.2K	5%	1/10W						
			(ALL EXCEPT KV-21FE12A)								
R1389	1-216-077-91	RES-CHIP	15K	5%	1/10W						
			(KV-21FE12A ONLY)								
R1390	1-216-025-91	RES-CHIP	100	5%	1/10W						
R1391	1-216-073-00	RES-CHIP	10K	5%	1/10W						
R1392	1-216-295-91	SHORT									
R1393	1-216-069-00	RES-CHIP	6.8K	5%	1/10W						
R1394	1-216-033-00	RES-CHIP	220	5%	1/10W						
R1395	1-216-033-00	RES-CHIP	220	5%	1/10W	C901	1-107-667-11	ELECT	2.2 $\mu$ F	20.00%	160V
R1396	1-216-033-00	RES-CHIP	220	5%	1/10W	C902	1-130-491-00	MYLAR	0.047 $\mu$ F	5.00%	50V
R1397	1-216-033-00	RES-CHIP	220	5%	1/10W	C903	1-126-925-11	ELECT	470 $\mu$ F	20.00%	10V
R1398	1-216-049-91	RES-CHIP	1K	5%	1/10W	C904	1-130-471-00	MYLAR	0.001 $\mu$ F	5.00%	50V
R1399	1-216-073-00	RES-CHIP	10K	5%	1/10W	C905	1-106-383-00	MYLAR	0.047 $\mu$ F	10.00%	200V
R1400	1-216-295-91	SHORT				C906	1-130-471-00	MYLAR	0.001 $\mu$ F	5.00%	50V
R1401	1-216-073-00	RES-CHIP	10K	5%	1/10W	C907	1-107-638-11	ELECT	33 $\mu$ F	20.00%	160V
R1402	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	C908	1-126-925-11	ELECT	470 $\mu$ F	20.00%	10V
R1403	1-216-049-91	RES-CHIP	1K	5%	1/10W	C909	1-161-830-00	CERAMIC	0.0047 $\mu$ F		500V
R1404	1-216-073-00	RES-CHIP	10K	5%	1/10W	C910	1-104-999-11	MYLAR	0.1 $\mu$ F	10.00%	200V
R1406	1-216-049-91	RES-CHIP	1K	5%	1/10W	C911	1-104-665-11	ELECT	100 $\mu$ F	20.00%	10V
R1407	1-216-065-91	RES-CHIP	4.7K	5%	1/10W	C912	1-126-941-11	ELECT	470 $\mu$ F	20.00%	25V
R1409	1-216-043-91	RES-CHIP	560	5%	1/10W	C914	1-130-491-00	MYLAR	0.047 $\mu$ F	5.00%	50V

\* A-1342-537-A VB (VAR) MOUNTED PC BOARD

4-382-854-11 SCREW (M3X10), P, SW (+)

**CAPACITOR**

C901	1-107-667-11	ELECT	2.2 $\mu$ F	20.00%	160V
C902	1-130-491-00	MYLAR	0.047 $\mu$ F	5.00%	50V
C903	1-126-925-11	ELECT	470 $\mu$ F	20.00%	10V
C904	1-130-471-00	MYLAR	0.001 $\mu$ F	5.00%	50V
C905	1-106-383-00	MYLAR	0.047 $\mu$ F	10.00%	200V
C906	1-130-471-00	MYLAR	0.001 $\mu$ F	5.00%	50V
C907	1-107-638-11	ELECT	33 $\mu$ F	20.00%	160V
C908	1-126-925-11	ELECT	470 $\mu$ F	20.00%	10V
C909	1-161-830-00	CERAMIC	0.0047 $\mu$ F		500V
C910	1-104-999-11	MYLAR	0.1 $\mu$ F	10.00%	200V
C911	1-104-665-11	ELECT	100 $\mu$ F	20.00%	10V
C912	1-126-941-11	ELECT	470 $\mu$ F	20.00%	25V
C914	1-130-491-00	MYLAR	0.047 $\mu$ F	5.00%	50V

**Note:**

The components identified by shading and mark are critical for safety. Replace only with part number specified.

**Note:**

Les composants identifiés par un trame et une marque sont critiques pour la securite. Ne les remplacer que par une piece portant le numero specifie.

<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>			<u>REF.NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REMARK</u>										
<b>CONNECTOR</b>																			
CN901 *	1-564-508-11	PLUG, CONNECTOR 5P																	
CN903 *	1-564-506-11	PLUG, CONNECTOR 3P																	
<b>DIODE</b>																			
D901	8-719-110-88	DIODE MTZJ-T-77-39					1-501-730-41	ANTENNA, TELESCOPIC (EXCEPT KV-20FS12/20FV12)											
D902	8-719-110-88	DIODE MTZJ-T-77-39					*	4-073-838-01	BAG, PROTECTION										
D903	8-719-991-33	DIODE 1SS133T-77					4-073-495-01	CARTON, INDIVIDUAL (KV-20FS12 ONLY)											
<b>TRANSISTOR</b>																			
Q901	8-729-017-06	TRANSISTOR 2SC4793					*	4-070-554-02	CARTON, INDIVIDUAL (KV-20FV12 ONLY)										
Q902	8-729-017-05	TRANSISTOR 2SA1837					*	4-073-479-01	CARTON, INDIVIDUAL (KV-21FM12/21FE12/A/C ONLY)										
Q903	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA					*	4-073-839-01	CARTON, INDIVIDUAL (KV-21FV12/C ONLY)										
Q904	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA					4-073-494-01	CUSHION ASSY, LOWER (KV-20FS12 ONLY)											
Q905	8-729-119-76	TRANSISTOR 2SA1309A-QRSTA					*	4-070-563-01	CUSHION ASSY, LOWER (KV-20FV12/21FV12/C ONLY)										
Q906	8-729-423-33	TRANSISTOR 2SC3311A-QRSTA					*	4-073-477-01	CUSHION ASSY, LOWER (KV-21FM12/21FE12/A/C ONLY)										
<b>RESISTOR</b>																			
R901	1-249-401-11	CARBON	47	5%	1/4W		4-073-493-01	CUSHION ASSY, UPPER (KV-20FS12 ONLY)											
R902	1-249-386-11	CARBON	2.7	5%	1/4W		*	4-070-562-01	CUSHION ASSY, UPPER (KV-20FV12/21FV12/C ONLY)										
R903	1-249-414-11	CARBON	560	5%	1/4W		*	4-073-478-01	CUSHION ASSY, UPPER (KV-21FM12/21FE12/A/C ONLY)										
R904	1-249-432-11	CARBON	18K	5%	1/4W		4-075-509-31	MANUAL, INSTRUCTION (KV-20FS12 ONLY)											
R905	1-249-417-11	CARBON	1K	5%	1/4W		4-075-501-31	MANUAL, INSTRUCTION (KV-20FV12 ONLY)											
R906	1-249-432-11	CARBON	18K	5%	1/4W		4-075-509-41	MANUAL, INSTRUCTION (KV-21FM12/21FE12/A/C ONLY)											
R907	1-249-386-11	CARBON	2.7	5%	1/4W		4-075-501-41	MANUAL, INSTRUCTION (KV-21FV12/C ONLY)											
R908	1-249-414-11	CARBON	560	5%	1/4W		1-417-182-11	CONVERTER (EAC-25) (ALL EXCEPT KV-20FS12/20FV12)											
R909	1-260-312-11	CARBON	47	5%	1/2W		<b>REMOTE COMMANDER</b>												
R910	1-216-476-11	METAL OXIDE	180	5%	3W		1-418-387-11	RM-Y168 REMOTE COMMANDER (KV-20FV12/21FV12/C)											
R911	1-249-403-11	CARBON	68	5%	1/4W		4-978-977-01	BATTERY COVER FOR RM-Y168 (KV-20FV12/21FV12/C)											
R912	1-247-815-91	CARBON	220	5%	1/4W		1-418-853-11	RM-Y172 REMOTE COMMANDER (KV-21FM12)											
R913	1-249-403-11	CARBON	68	5%	1/4W		3-709-322-01	BATTERY COVER FOR RM-Y172 (KV-21FM12)											
R914	1-249-410-11	CARBON	270	5%	1/4W		1-418-852-11	RM-Y173 REMOTE COMMANDER (KV-20FS12/21FE12/A/C)											
R915	1-249-417-11	CARBON	1K	5%	1/4W		3-709-322-01	BATTERY COVER FOR RM-Y173 (KV-20FS12/21FE12/A/C)											
R916	1-249-417-11	CARBON	1K	5%	1/4W														
R917	1-249-417-11	CARBON	1K	5%	1/4W														
R918	1-247-807-31	CARBON	100	5%	1/4W														
R919	1-247-807-31	CARBON	100	5%	1/4W														
R920	1-249-416-11	CARBON	820	5%	1/4W														
R921	1-249-429-11	CARBON	10K	5%	1/4W														
R922	1-249-397-11	CARBON	22	5%	1/4W														
R923	1-249-401-11	CARBON	47	5%	1/4W														



**Sony Corporation**  
Sony Technology Center  
Product Quality Division  
Service Promotion Dept.

9-965-879-91

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# SERVICE MANUAL

# BA-5 CHASSIS

MODEL NAME	REMOTE COMMANDER	DESTINATION	CHASSIS NO.
<b>KV-20FS12</b>	RM-Y173	US	SCC-S40A-A
<b>KV-20FS12</b>	RM-Y173	CND	SCC-S41A-A
<b>KV-20FV12</b>	RM-Y168	US	SCC-S40B-A
<b>KV-20FV12</b>	RM-Y168	CND	SCC-S41B-A
<b>KV-21FE12</b>	RM-Y173	E	SCC-S38A-A
<b>KV-21FE12A</b>	RM-Y173	E	SCC-S38F-A
<b>KV-21FE12C</b>	RM-Y173	E	SCC-S38B-A
<b>KV-21FM12</b>	RM-Y172	MX	SCC-S39A-A
<b>KV-21FV12</b>	RM-Y168	E	SCC-S38C-A
<b>KV-21FV12C</b>	RM-Y168	E	SCC-S38D-A

## CORRECTION - 2

SUBJECT: IC1001 AND IC1301 P/N CORRECTION

Correct the service manual as shown.  
File this Correction with the service manual.

: Corrected Item

Section 8: Electrical Parts List - Page 66

Incorrect			Correct		
REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
IC1001	8-759-658-03	IC M37273MF-258SP	IC1001	8-759-834-21	IC M37273MFH-051SP
IC1301	8-752-092-17	IC CXA2131AS (ALL EXCEPT KV-21FE12A)	IC1301	8-752-098-79	IC CXA2131CS (ALL EXCEPT KV-21FE12A)

TRINITRON® COLOR TELEVISION  
**SONY**®

HISTORY INFORMATION FOR THE FOLLOWING MANUAL:

# SERVICE MANUAL

# BA-5 CHASSIS

<u>MODEL NAME</u>	<u>REMOTE COMMANDER</u>	<u>DESTINATION</u>	<u>CHASSIS NO.</u>
<b>KV-20FS12</b>	RM-Y173	US	SCC-S40A-A
<b>KV-20FS12</b>	RM-Y173	CND	SCC-S41A-A
<b>KV-20FV12</b>	RM-Y168	US	SCC-S40B-A
<b>KV-20FV12</b>	RM-Y168	CND	SCC-S41B-A
<b>KV-21FE12</b>	RM-Y173	E	SCC-S38A-A
<b>KV-21FE12A</b>	RM-Y173	E	SCC-S38F-A
<b>KV-21FE12C</b>	RM-Y173	E	SCC-S38B-A
<b>KV-21FM12</b>	RM-Y172	MX	SCC-S39A-A
<b>KV-21FV12</b>	RM-Y168	E	SCC-S38C-A
<b>KV-21FV12C</b>	RM-Y168	E	SCC-S38D-A

**ORIGINAL MANUAL ISSUE DATE: 2/2000**

ALL REVISIONS AND UPDATES TO THE ORIGINAL MANUAL ARE APPENDED TO THE END OF THE PDF FILE.

REVISION DATE	REVISION TYPE	SUBJECT
2/2000		No revisions or updates are applicable at this time.
3/2000	Correction - 1	Block Diagram, A Board Voltage Table, Parts List (All Variant Parts Identified)
2/2002	Correction - 2	IC1001 and IC1301 P/N Correction

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